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# ADDRESSES AND ORIGINAL ARTICLES

## RADIOTHERAPY IN CANCER OF THE UPPER AIR PASSAGES.*

BY W. DOUGLAS HARMER, M.CHIR. CAMB., F.R.C.S. ENG.,

CONSULTING SURGEON TO THE THROAT DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL.

WHEN I received the invitation from the University of London to review the position of radiotherapy in the treatment of cancers of the upper air passages, I decided to circularise a letter to all our leading laryngologists and to many prominent clinics abroad. From 210 people that I approached in Great Britain there were 70 replies, and the great majority made it quite clear that radiation treatment had been of little value to them; many of them said quite frankly that "it did no good," that "the profession had gone radium mad," or that "radium killed more people than it relieved." There is no doubt that in this country the pioneers of radiotherapy have met with great opposition and very little encouragement, and yet more and more workers are becoming interested in the subject. It is hoped therefore that before long every hospital will realise that it is impossible to give radiation treatment properly unless all patients suitable for it are handed over to a group of specialists.

The importance of early diagnosis and early treatment cannot be overstated, and practitioners must be educated to send their patients to such centres as soon as there is any suspicion of malignancy. Under no circumstances must a cancer case be placed on a waiting-list. Unfortunately a large percentage of cancer cases of the upper air passages are often treated by repeated minor operations or inadequate radiations before they are sent to a specialist and by then the chance of cure has been lost. Biopsies, though uncertain, are in most cases essential both to confirm the diagnosis and to determine the type of growth; and as many of these growths are very virulent it is safer to remove a fragment with endothermy or only after a preliminary radiation treatment has been given. In doubtful cases it is better to rely upon clinical appearances rather than upon the histological report.

### General Remarks on Irradiation.

Mrs. Quimby and her co-workers have shown that nearly all cancers in the upper air passages are radiosensitive to some extent, but that, owing to their depth from the surface, it is difficult to deliver an adequate tissue dose. They have therefore divided the treatment into two parts, distance radiation (X rays or radium) followed by interstitial radiation. The whole dose is given in a relatively short period—namely, 20 days. Finzi's technique of X ray treatment to the larynx and hypopharynx consists in the use of six ports of entry at an angle of 60° to one another; the ports of entry overlap and treatment is given each day; the total dose is split, so that two, three, or four rounds are given. The treatment is applied on five or six days in each week, and is continued even when the mucous membrane and skin get very sore. If radium is used in combination with X rays, the dose of each is reduced.

Radium (surface or interstitial) in contra-distinction to X rays must be considered as a short range gun. Clinically and experimentally it has been noted that the best results are obtained when radium is applied in close apposition to the lesion. Should the "radium-lesion" distance be increased even by a short amount the dose required to produce a similar effect may be 40 times as large.

The total dose and the factors of time and filtration are of great importance. The amount of radium used is determined by the volume and extent of the lesion. The whole diseased area must be uniformly irradiated. Personally, I think that this can be done more certainly with needles than with seeds. If possible the needles should be distributed around the tumour rather than into it. The use of small doses over long periods has certainly given better results than large doses for a short time. Another important factor is the split dose. Spear (unpublished) has shown recently that the effect of radiation can be enhanced four to five fold by giving a series of exposures at short time intervals (approximately one and a half hours).

Filtration is a difficult subject. I believe that the physicists are to blame for advising us to use thin filters such as 0·5 mm. of platinum. Except in very experienced hands, it is safer to employ filtration of 0·6 or 0·8 or even 1 mm. of platinum. With such filtration radium causes very little damage to the surrounding tissues and needles can safely be placed close to or into bones without fear of necrosis. Cade inserted 36 needles with 0·8 mm. of platinum filtration, carrying 78 mg. of radium into a large growth around the lower jaw, for 216 hours, without any severe reaction and obtained a remarkable palliative result. In the same way necrosis of the cartilage can be avoided.

#### EFFECTS OF IRRADIATION.

Patients who have suffered from syphilis, who are chronic alcoholics, who have lived in the tropics or who are seriously debilitated or anæmic rarely respond well to radiation treatment. Mottram has shown experimentally that if animals are made anæmic by bleeding they receive no benefit at all from rays. Equally important is the ray sensitivity of different grades of cancers and the condition of the stroma. Although there is no experimental evidence of the stimulating effect of radiation on the growth of tumours, this may occur clinically if too small a dose is given. The occurrence of rapid dissemination after irradiation is attributed at times to the radiation, but it is more likely that the trauma or the surgery of interstitial irradiation is responsible for this than the rays themselves.

Should rays be repeated? All seem to agree that they should not. Regaud says "C'est funeste." And yet everyone has to do it. There is no doubt that the previous treatments often make cancer radio-resistant, but the time elapsed since the first treatment, the nature of the recurrence and the extent thereof, must be taken into consideration before repeating the ray treatment. Above all, steps should be taken to verify the diagnosis, so that a delayed radium burn should not be mistakenly irradiated under the impression that it is a recurrence. No patient who has received ray treatment elsewhere should be given either X rays or radium until all details of the previous treatment have been obtained, otherwise the result may be disastrous.

* Abstract of the Semon Lecture (University of London) entitled "The Relative Value of Radiotherapy in the Treatment of Cancer of the Upper Air Passages," delivered at the Royal Society of Medicine on Nov. 5th, 1931. For publication later.

### POST-IRRADIATION CHANGES.

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1. *Total disappearance of the growth.*—When this occurs, the tissues regain a normal appearance. Forssell is of the opinion that the permanency of healing is as great after irradiation as after excision.

2. *Fibrosis or partial healing.*—This occurs often in a patient with septic infection, from under-dosage or insufficient screenage. When possible, the scar should be excised by diathermy, as these remnants always contain islands of cancer cells surrounded by scar tissue.

3. *Œdema.*—It is not understood why in certain individuals irradiation is followed by œdema; it may be due to a specific type of infection. It is always of serious significance.

4. *Ray sores.*—Ray burns must be distinguished from the normal reactions. The latter are painless and heal rapidly. Burns may result from over-dosage or deficient filtration; they are very painful, form tenacious sloughs, heal very slowly, and are the cause of great distress. In rare instances a callous sore may develop and remain unhealed for many years. If possible, radium burns should be excised by diathermy.

5. *Necrosis.*—This complication, particularly in the larynx, appears to be common in many clinics. Our experience is that it rarely occurs if adequate filtration is employed and if care is taken to prevent sepsis.

6. *Pain.*—The actual radiation treatment is painless. The normal reaction is more a discomfort than pain. Besides definite radium burns causing pain, persistent severe neuralgia occasionally supervenes and may be due to chronic sepsis, ulceration, or fibrosis, or may signify that the whole disease has not been destroyed.

7. *Mortality.*—In skilled hands the operation mortalities have certainly been less than with major excisional operations. The principal causes of death after irradiation are infections causing hæmorrhage, pneumonia, or, rarely, meningitis.

## The Larynx.

### OPERABLE GROUP.

Intrinsic carcinoma of the larynx is one of the best types of cancer in the whole body because it can be diagnosed early, while it is an entirely local disease. Usually the patient is sound in health, the glands in the neck are not affected, there is no blood infection, dissemination is rare, and the expectation of life is good. Given an intelligent selection of cases, the results obtained by surgery have been very good indeed, but probably if a census were taken of cases treated by all surgeons, we should be startled at the poor results, the chief reason being that there are really very few patients who can be safely treated by laryngofissure. At present there is not even any agreement as to what is the best operation, because the grade of the disease seems to be as important as the size and the situation. And yet the majority of laryngologists still prefer surgery to radiation because in most hands the latter has given such poor results, and the dangers have been considerable owing to faulty treatments.

Turning to those who have had wide experience of radiation we find that carcinoma of the ventricular band is highly radio-sensitive; of the cord, favourable for rays; and of the subglottic region, resistant. Regaud considers that less progress has been made with treatment of these cases than in other parts of the body; Escat (130 cases—mostly extrinsic) that radium as a sole agent gives truly bad results; Hinojar that rays give temporary relief but that recurrences in three years are common.

At present there is certainly no agreement as to the best method of giving rays. Thus we find X rays alone favoured by Coutard, Lacassagne, Joly, Lemaitre, Carulla, and many German workers; radium and X rays by Halberstaedter, Gunsett, and others; radium and surgery by Ledoux, Quick, Canuyt, and many more. Personally, I consider that buried radium has given such good results in my cases that I no longer consider that it is ever necessary to remove a growth by surgery. My practice is to treat all these cases first with radium. If the disease does not disappear at once it will usually be arrested and there need be no hurry in deciding the further line of treatment. As a rule radiation should not be repeated in these cases unless the patient is unfitted for laryngectomy. The amount of radium used is so small that it does not contra-indicate complete removal afterwards. Recurrences, if small, can sometimes be treated with radium a second time, but surgery should be carefully considered. Nearly all these growths are radio-sensitive, but with minor variations. It may be difficult to decide how to deliver the dose; many failures have been due to the mistake of not realising that the disease was more extensive than it appeared at the time of the treatment, so that the peripheral part of it never received adequate radiation.

In the larynx we have one of the best instances of the short range of the efficacy of gamma rays. For inserting the radium the modification of Ledoux's operation (fenestration) is suitable for growths absolutely localised to one vocal cord or band. When the growth has crossed the middle line the needles must be placed bilaterally. When it has extended down into the subglottic region, the principle of (or modification of) Hautant's operation should be employed and long needles inserted. Upward extension may necessitate removal of the cornu of the hyoid bone.

To avoid complications the greatest care must be taken:

1. As regards the anæsthetic; a local injection of novocain may be used or the patient may be put to sleep. In the latter case he should be given nembutal two hours before the operation; an injection of morphia half an hour before, if he is not drowsy; then gas and oxygen with a small amount of ether will be sufficient to keep him quiet, and with this method there is very little danger of pneumonia.

2. Sepsis must be avoided at all costs, by gentleness in manipulation of the tissue, by complete and careful hæmostasis, and by closing the skin wound completely.

3. The wound should never be damaged, care being taken not to cut through the capsule of the perichondrium which surrounds it.

4. To prevent œdema, perichondritis and late reactions, full filtration is necessary (0·6 to 0·8 mm. of platinum).

5. Tracheotomy should not be performed if the opposite cord is movable and the glottis is adequate; when in doubt the front of the trachea can be exposed and left ready for an opening if necessary.

With these precautions we have treated eight cases of this group (suitable for thyrotomy). Of these, seven are living free from disease—two for six years, one for five years, one for three years, and two for less than three years. One case had a recurrence after four years and was treated by laryngectomy by Colledge. One case living six years has now a small recurrence.

### BORDERLINE GROUP.

Unfortunately, the majority of laryngeal cancers come to the specialist so late that the disease is widespread and cannot safely be treated by thyrotomy. Laryngectomy or radiation must be advised. Surgical treatment should only be undertaken by those who have frequent opportunities of performing these major operations, never as an occasional treatment.

Ray treatment combined with surgery is capable of giving good results. It can be carried out with safety and with good prospects of success only in those clinics which have group specialists, an adequate supply of radium, and an efficient X ray plant. Personally, I prefer interstitial radium after removal of the thyroid and cricoid cartilages, with pre- and post-operative radiation. Of this group of cases we have treated 20 patients, many in a poor state of health and quite unfit for severe operations. One remained free from disease for six years and then died of psittacosis; a second case is well for five years;

two for two years; and one for less than a year. Of the patients dead five lived less than one year, and five over two years. Most of the latter received temporary relief and were able to work, free from pain and believing that they were cured.

INOPERABLE GROUP.

When a growth has extended beyond the limits of the laryngeal cartilages or through them, so that the tissues of the neck are invaded, and particularly when there are glands on both sides of the neck, laryngectomy should never be undertaken. Many of us must have seen instances in which the attempt to remove an extensive growth completely by laryngectomy failed with disastrous results.

In this group I have 19 cases, of whom 15 are dead, one after four years, and three are living for less than a year. The total number collected includes 351 patients, of whom 209 are dead, 116 living, and 23 free from disease for three to five years or more.

Although the results of ray treatment in most centres have proved unsatisfactory I believe that this is due to faulty technique, inadequate dosage, and underestimation of the extent of the disease. In our hands the percentage of cures in operable cases appears to be at least as good as with operations. For the borderline group radium should always be tried before laryngectomy. The time has arrived when one may ask the question whether it is ever safe to perform a laryngectomy unless the patient has received preliminary ray treatment in some form. If the disease is not cured by radiation within three months, or if any induration remains in the larynx, it is safer to advise laryngectomy rather than to repeat radium treatment. Unless very intense radiation has been employed laryngectomy can safely be performed. Even in inoperable cases, some relief of symptoms and prolongation of life can be obtained by radium. If the growth has infiltrated the cartilages extensively or has perforated into the neck, interstitial radium should not be employed—better results can be obtained with less risk of sepsis by external irradiation with X rays or radium followed by intubation with radium.

## The Hypopharynx.

Under this heading are included all cancers of the pyriform fossa or of the posterior pharyngeal wall and the extrinsic laryngeal growths. In a recent publication New states that only six out of 78 cases of this group were suitable for treatment, the remainder (72 cases) being inoperable, with an average estimated life of five months. In a recent lecture Trotter stated that the chances of cure may be frittered away by attempts at irradiation, but that for inoperable growths radium without opening the pharynx is advisable and that radium is promising in the doubtful cases. Occasionally pharyngo-laryngectomy gives good results; Arthur Evans has one case well after 18 years; Cade has two cases living free from disease 5½ and 4½ years after operation. He considers that pharyngo-laryngectomy is less dangerous than pharyngotomy, except in very localised lesions. At our hospital all these methods have been tried but with very little success. I consider that a combination of surgery and radiation is better treatment than simple excision.

Removal of the thyroid and cornu of the hyoid and insertion of radium needles is suitable for growths involving the epiglottis, aryepiglottic fold, or pyriform fossa, but not for a growth in the posterior part of the larynx. It is less likely to cause complications than open needling of the pharynx. In extensive lesions with large fixed glands, heroic operations rarely result in a cure; palliation—relief of symptoms and prolongation of life—can only be obtained by X rays or radium.

So far we have no really safe method of treating these cancers; this is shown by the figures I have collected. In 520 cases treated by various forms of irradiation 441 are dead, 59 are living, and only 21 free from disease for one to five years or more. Our own material shows 106 cases treated by rays, 95 dead (70 in less than a year), 23 after a year; only 11 are living. Further research in the radiation treatment of cancers of the hypopharynx is urgently needed.

## The Nose.

Extrinsic growths starting in the skin are either rodent ulcers or squamous-celled carcinomas. Roy Ward (1773 skin cases) describes three clinical varieties of rodent ulcer: hypertrophic, ulcerating and cicatrising, deeply ulcerating. In all types radiation is better than excision, but in resistant growths excision by diathermy is indicated and is preferable to the knife. Surface irradiation by beta and gamma rays gives good results in early lesions, but needling is preferable for advanced cases and recurrences.

The carcinomata may commence spontaneously or develop in scar tissue or in a previously existing rodent ulcer, lupus, or even endothelioma. They have a very chronic course, penetrate deeply, extend widely and, although persisting for years, rarely affect the lymphatic glands or produce metastasis. Their behaviour is quite unlike that of carcinoma in any other part of the body. They are difficult to cure, although their progress may be kept in check for many years.

The best method of treatment is to use surface radium or a mould, giving split doses over prolonged periods of time (two to four weeks), supplemented occasionally by buried radium along the edge of the lesion. There is, however, an inveterate tendency for these cancers to recur, so that many treatments may be necessary both by radium and diathermy.

NASAL SINUSES (ANTRUM, ETC.).

In this situation there is great variation in the types of growth. Ewing has described 37 different types. The commonest type is carcinoma, the predominating form being a cylindrical carcinoma of the adenocarcinomatous type. For practical purposes all the tumours are malignant, but in their early stages may cause very little trouble, so that the true diagnosis is often overlooked. They tend to recur locally, but glandular involvement is late and metastases occur only in the last stages of the disease. I am aware that New states that cervical metastases are found in 73 per cent. of the disease, but this is certainly not my experience. I also find that the commonest form is a squamous-celled carcinoma.

Surgery alone has given very unsatisfactory results. In a series of 23 cases which I treated by some form of excision of the maxilla, there were two operation deaths; of 18 carcinomas, only two remained free from disease for more than three years, one of them (cylindrical) for 20 years. E. D. D. Davis treated 39 cases with surgery only: 13 carcinomas, three free from disease for 1 to 2½ years; four round-celled sarcomas, all recurred; two spindle-celled sarcomas, both free from disease for five and eight years; seven endotheliomas, all free from disease from three to five years. Surgery and radiation had undoubtedly improved the results.

BORDERLINE GROUP WITHOUT METASTASES.

Preliminary treatment with X rays is advisable; followed by a biopsy through the inferior meatus or the canine fossa. If malignancy is established, the next essential step is to provide adequate drainage and exposure, so that the limits of the disease are shown. Opinions are divided as to the approach; personally, I prefer the palatal route, as this gives the best drainage, offers the best means of inspection, and causes no external deformity or defects in speech, and swallowing can be easily repaired later by a watertight denture. If large enough, this method gives access to the antrum, nasal fossæ, the higher ethmoidal cells, and the sphenoidal regions. Removal of the obvious part of the growth can be done with the diathermy; but in most cases this can be only a partial removal, and it is essential to treat the peripheral extensions with radiation.

Two methods are possible: (1) to insert a large dose of radium immediately, 50 mg. filtered with 1 mm. of platinum, for one or two days, with additional needling of the ethmoidal region when necessary; (2) to leave the wound for a week and then treat the cavity with radium, in split doses, over prolonged periods, by means of a plate so moulded that it fills the cavity, carrying on its outer surface a requisite quantity of radium in small needles. The apparatus is worn six or eight hours daily until the whole cavity is completely covered with a fibrinous film. As a rule, ten days are required to deliver an adequate dose.

Such a treatment is not without danger. There may be an active inflammation of the pharynx, soft palate, and buccal mucosa, as well as of the skin of the face and of the conjunctiva. The tongue can be protected by incorporating a lead plate in the denture. The eye itself is not affected.

INOPERABLE GROUP.

It is questionable whether any treatment should be attempted, but in rare cases when the growths have not extended too widely into the zygomatic fossa, X rays may give palliative relief of pain and bleeding.

The cases that I have collected show a total of 819 treated by combined surgery, diathermy and irradiation; 427 are dead and 256 are living, many for long periods. Our own material shows that of 53 cases treated only ten are living, two for 8 years and 19 years respectively; 40 are dead; 31 succumbed within a year. These are bad results, but are due to the fact that most of the cases were quite inoperable and treatment aimed solely at palliation. I believe that now, in early cases, we can expect good results in one-third of the cases.

SARCOMA.

Almost all forms of sarcoma met with in other parts of the body are found in the nasal sinuses. They vary greatly in malignancy and can be subdivided into three groups:—

*Group 1.*—Myeloid and fibrous type: grow very slowly, metastasise rarely.

*Group 2.*—Chondro; osteo- and myxo-sarcoma: more uncertain in their course.

*Group 3.*—A fairly large group of round- and spindle-celled types; highly malignant. Biopsy is an essential preliminary to treatment and is safe after a small dose of X rays.

Surgery is the best treatment for the first group. In group 2 we have forms which are apt to recur, and a combination of surgery, diathermy, and radium is indicated. In group 3, surgery is fraught with great danger. Sometimes the growth is so sensitive that it disappears completely with X rays and surface radium, and this treatment should always be tried first. Even in cases where rays fail, it is seldom possible to excise the whole disease.

Our results with sarcoma have been much better than with carcinoma. Of 31 cases treated, 16 are dead and 12 are living; seven free from disease for over three years; four of them have remained well for 7, 8, 9, and 10 years respectively. As will be shown later, good results have been obtained by ray treatments of sarcomas in other parts of the throat. There is no doubt that many of these growths are very sensitive to rays, whereas surgery alone gives very poor results.

## Nasopharynx.

An enormous amount of literature has been published on tumours of the nasopharynx, and most authors are agreed that the commonest type is carcinoma. Clinically, most of these growths are highly malignant; usually they are far advanced before the patient seeks advice and the disease has invaded the base of the skull and the bones at the back of the nose. Metastases in the glands occur earlier with carcinomas than with sarcomas. With the latter, metastases in other parts of the body invariably occur unless the disease can be treated early.

It has been noted by many authors that the diagnosis is often difficult, particularly in cases of sarcoma. It is a mistake to accept the microscopic report that there is no evidence of malignant disease. In one of my cases, although a large tumour was removed, negative reports were received from several distinguished pathologists and the true nature of the disease could not even be agreed upon when it had formed metastases in the lungs, liver, and every other part of the body. As nearly all the growths in this situation are highly malignant a rule should be made always to give them irradiation before trying to confirm the diagnosis by a biopsy. Surgery in this region is useless and dangerous. To deliver an adequate dose to so deep a situation as the base of the skull intense X rays must first be given and later a supplementary local treatment with radium. X rays alone should be reserved for palliation only.

The radium may be applied either in the form of a suitable tube containing 50 mg. well filtered with 2 mm. of platinum drawn into the nasopharynx through the mouth and retained by strings passed through the nose for 24 to 48 hours according to the amount of previous X ray treatment; or perhaps by passing tubes through the nose and treating the disease with split doses for a week or longer until the requisite dose has been administered.

Even if the growth is highly sensitive and disappears rapidly, the maximum treatment that is safe should always be given. The total dose varies from 1500 to 3000 mg. hrs. according to the extent of the growth. Severe reactions may result from this treatment but are inevitable. Often after the acute inflammation has subsided the healing of the tissues is very slow and radium necrosis is common. The sequestra may not separate for months. The treatment is severe and the patients may suffer from dryness of the upper air passages leading to great discomfort for long periods. As Quick expressed it, "We know what happens without treatment."

Although these growths are serious the prognosis of sarcoma is not hopeless. Long-standing cures have been reported and great prolongation of life can be expected if treatment is given early before the glands are affected. Of 63 cases treated by rays, 30 are dead and 33 living—22 free from disease for two to five years or more. Analysing our material, there are 16 patients, of whom 7 are dead (6 within a year) and 9 living, 6 of them free for two to nine years. On the other hand, I can find no records of long-standing cures of carcinoma. In many cases primary healing has been obtained and the symptoms have been greatly ameliorated. From a total of 86 carcinomas only 10 are living free from disease and only 5 from

two to four years. Obviously therefore the prognosis of carcinoma is very much worse than that of sarcoma.

## Tonsil and Mesopharynx.

### CARCINOMA.

Although diagnosis is usually easy, most surgeons agree that a biopsy is essential. It is safer to remove tissue for examination after a preliminary ray treatment. Most surgeons agree that these growths are so malignant that simple removal with a knife is dangerous and ought never to be attempted. Diathermy is a much safer treatment and Norman Patterson is of the opinion that it is the best. Personally, I have used diathermy for many cases but always in combination with radiation.

Most surgeons are agreed that some form of radiation is essential, but it is difficult to decide what is the best method of delivering an adequate dose.

New (98 cases) prefers X rays or radium for the neck, seeds into the tonsil, and in some cases diathermy for the primary lesion. At the Paris Radium Institut (174 cases) X rays or distance radium is the method of choice; 42 cases, some with enlarged glands, well for 1 to 5 years. Simpson and Flesher (60) radium treatment. Seven well, three from 2½ to 4½ years. Robinson (27 cases). All treated with radium, none with glands cured. One well for 7 years, one for 2½ years, two for 2 years. Depous at the Portman Clinic: Surgical removal of glands, ligature of external carotid, radium needles to tonsil, X rays and surface radium to neck. Coutard gives only X rays. Cade (19 cases) primary lesion—radium needling or diathermy, preferably the former. If glands not palpable—radium collar or X rays. If glands palpable but absolutely operable, Crile's block dissection if the primary lesion is healed and above suspicion and the general expectation of life good. In borderline and inoperable cases—radiation only, by closed or open needling followed by surface irradiation. Berven divides his cases into three groups: (1) without metastases: continued teleradium (bomb), surface and interstitial radium; endothermy. (2) Operable metastases: advises teleradium without surgery, then if remnants remain, dissection with implantation of needles. (3) Inoperable metastases: radium treatment the only possible method. During the last year he has treated all his cases with teleradium, and believes that with the new technique the results have been greatly improved. He says: "The evidence goes to show that radium is better than X rays."

Personally, I consider that surgery is useless; that the primary lesion should be treated in most cases with needles and any remaining induration with the diathermy knife; that in all cases the neck should be treated by massive irradiation, part of the dose to be given before and part of it after the treatment of the primary lesion. Block dissection should rarely be undertaken and that even then needles or seeds should be placed in the wound.

The results of all the different methods of treatment are still unsatisfactory. Of 606 collected cases, 381 are dead, 126 living free from disease, and only 36 for three to five years. We have treated 64 patients, of whom only 5 are living for periods up to one year. Of 57 dead, 50 succumbed in a year, and only two lived for five and ten years respectively. Coutard's results are better; 27 per cent. living free from disease for three years, but the rate drops to 19 per cent. in five years and 3 per cent. in eight years. The adoption of teleradium by Berven as part of the treatment has produced very encouraging initial results. He uses this method in conjunction with local treatment and he employs a radiation field of small diameter. The radium skin distance is the smallest yet used with a 3 g. unit. Whereas by the old method healing of the primary growth occurred in 25 per cent. of cases and not a single patient was free from disease for two years or more, by the new method primary healing occurs in 42 per cent. for a year, 35 per cent. for two years, and in 28 per cent. for three or more years. These figures show the superiority of the new method and serve to emphasise that, with further research, the radiation treatment of new growths in this situation may give results which to-day are impossible to forecast.

### SARCOMA.

Sarcoma of the tonsil is much rarer than carcinoma. Almost all surgeons agree as to the risks of surgical intervention, and it has been noted that biopsies often fail to give a definite diagnosis. Finzi and others are of the opinion that biopsies without preliminary radiation are apt to lead to general dissemination.

New says that treatment should be "irradiation unquestionably," either by X rays only, as advised by Coutard, or by X rays followed by radium. For the primary lesion Berven uses an applicator which is very ingenious and has the advantage that the growth is not damaged. If this is not available needles or seeds must be used. For the glands, surface radiation (collar or bomb) is preferred to interstitial treatment, but the latter may be successful.

Statistics that I have been able to collect show that far better results can be obtained by irradiation of sarcomas than of carcinomas in this region. About half the patients obtain good primary results and the duration of life is greatly prolonged in many cases. The total cases show that of 92 patients, 59 are dead, 33 living, 28 free from disease for three to five years or more. Our series only includes eight cases, of whom three are dead and five living, two of them free for seven and 11 years respectively. Of the three dead, one lived for four years and a second for five years.

## Palate and Cheek.

The majority of growths in these situations are squamous-celled carcinomata; less common are the endotheliomata and the sarcomata. Cade considers that clinically the carcinomata can be divided into four groups: papillary, nodular, ulcerous, and fissured, a grouping which denotes roughly the degree of malignancy. Broders and others have shown that these vary greatly in their virulence. Equally important is the situation of the lesion, those of the buccal mucosa being of a more serious prognosis than the palatal growths. The prognosis of lesions on the soft palate and uvula is more serious than that of growths of the hard palate. In the former the growth is of a more virulent type, and frequently spreads to the glands on both sides of the neck. The following table shows the percentage of glandular infection in 30 cases examined by Cade:—

| | Total. | Glands enlarged and percentage. | Number of glands and percentage. |
|---|---|---|---|
| Soft .. | 19 ..... | 14 (77) ..... | 5 (23) |
| Hard .. | 11 ..... | 2 (18) ..... | 9 (82) |

I believe that the primary growth should be treated before the glands except in very rapidly growing tumours, in which a pre-operative X ray treatment to the primary and lymphatic area should always be given. Afterwards the growth should be treated by needles, seeds, or by surface radium, as X rays alone cannot be relied upon to destroy the growth. For the hard palate a denture carrying radium is a simple method of giving surface treatment, and for protection of the tongue it should be lined on its under surface with 1 mm. of lead. If complete healing is not obtained in a reasonable period the induration should be excised by diathermy.

The treatment of the glandular area presents many difficulties. Shortly stated, the following routine may be followed:

(1) If no glands can be found on examination, and the growth is not a very virulent type, the neck may be left

untouched but must be examined periodically for at least 12 months to make sure there is no disease. When the growth is of a rapidly growing type or situated on the soft palate or cheek, the neck should be irradiated by X rays or surface radium. There is no evidence that block dissections improve the prognosis in these conditions.

(2) Small, movable, unilateral glands should be removed, preferably after preliminary irradiation. Levitt is of the opinion that the best results that he has obtained with X rays have been in those cases where the greater part of the glands had been removed.

(3) Large, fixed, or bilateral glands are always inoperable but can be arrested by a combination treatment. X rays alone can be used, or X rays followed by radium or radium alone. Regaud and specially Berven have had very good results with distant radium (bomb). Even if palliation only is obtained, its benefits are great; in Quick's words, "it extends far beyond the limits of surgery, the growth is checked, the source of metastatic emboli is eliminated, pain and fungations are prevented." An investigation of 40 specimens of lymphatic glands removed by Quick showed that much better response followed intense irradiation than small dosage.

The results are on the whole good. In a total of 512 patients, 240 are dead and 182 alive, 67 for three to five years. Our material includes 35 cases, of whom 21 are dead and 11 living, all but one free from disease

## Endothelioma.

These growths are not uncommon in the palate, pharyngeal wall, nasopharynx, and in the neck; very rarely they commence in the larynx, back of the tongue, face, orbit, or lacrymal glands. These tumours can never be trusted to remain quiescent, and the sooner they are removed the better the prognosis. In their early stages they have a dense fibrous capsule and are easy to enucleate; but there may be a small area of the tumour which is adherent to the surrounding tissues where the capsule is incomplete. This is the base of attachment, and should be cauterised to prevent local recurrence.

The treatment we generally adopt is (1) preoperative X rays; (2) a week later enucleation of the growth, removing as much of it as possible; (3) insertion of radium, one single large dose, or small doses by the split method. In general it may be said that all endotheliomata are radio-sensitive in their early stages, and that some may be cured by irradiation alone. An analysis of cases collected shows that, although these tumours are very difficult to cure, great prolongation of life can be expected in a large percentage of cases. Thus, out of 47 patients, 23 are dead and 24 are living.

### TRANSITIONAL CELL CARCINOMAS AND LYMPHO-EPITHELIOMAS.

These two types of carcinoma deserve special consideration because they are so highly malignant and have a remarkable susceptibility to radiation. They may commence in the tonsil, base of the tongue (lingual tonsil), nasopharynx, larynx, and perhaps in the œsophagus. Ewing found amongst 300 tumours of these regions that 10 per cent. were transitional types and 6·3 per cent. lympho-epitheliomas. The clinical symptoms are similar to those found with sarcoma—namely, rapid growth with formation of very large tumours, which may ulcerate deeply and cause early involvement of glands (large) and early metastases (rare with other carcinomas), causing severe neuralgic pain, dysphagia, and marked general debility. As Cutler has pointed out, more patients have sought advice regarding a mass in the neck than for intra-oral symptoms, and a thorough search may fail to reveal the primary growth.

The lympho-epitheliomas, first described by Regaud and Schminke in 1921, are rare: thus Schminke (1921), five cases; Jovin (1927), seven; Cutler (1929), four; Berven (1931), six. All authors are agreed (1) as to the extremely bad results of surgery and the danger of dissemination after trauma; (2) that these growths are extremely sensitive to radiation, even with relatively small doses. In many cases this causes a rapid disappearance of the swellings. Berven reports one instance in which the growth almost filled the mouth, but was reduced to a mere remnant by rays in 11 days.

X rays should always be employed first.

This treatment is favoured by Schminke: 5 cases, all primary healing; 1 developed metastases later; later results not stated. Jovin, 7 cases treated by Coutard: 1 free for four years; 1 no primary healing; distant metastases developed in most of them. Cutler: 9 cases (transitional 8, lympho-epithelioma 1), all free from disease; for 11 years, 1; nine years, 1; five years, 1; four years, 3; and three years, 3. But it is emphasised that these represent but a small percentage of the totals treated.

If X rays are not successful gold seeds are also inserted. The chief danger is early dissemination of the disease to the viscera, due to (1) failure completely to sterilise the primary lesion or glands; (2) dissemination by operative trauma; (3) the presence of metastases when treatment is instigated.

Berven—6 cases (tonsils)—has obtained primary healing in 100 per cent. with X rays and teleradium; and 75 per cent. remained free from symptoms for three years or more. His results show: living five years, 1; four years, 1; three years, 1; over two years, 2. The sixth case died free six months after treatment from pneumonia. These are very remarkable results.

## Total Results.

The statistics that I have given are of great interest but are not a complete picture of the results obtained because in some instances the total cases treated by other surgeons have obviously not been stated. Surveying the total results, exclusive of the cases that have been lost, we obtain the following table:—

| — | Total collected. | Living and percentage. | Our material. | Living and percentage. |
|---|---|---|---|---|
| Carcinomas .. | 2687 | 791 (29) | 313 | 60 (19) |
| Sarcomas .. | 259 | 110 (42) | 66 | 32 (50) |
| Endotheliomas | 47 | 24 (51) | 32 | 15 (47) |

As far as the sarcomas and endotheliomas are concerned our results are about the same as those in other clinics. But in the carcinoma group the percentages are very different—19 as against 29 per cent. living. This is largely due to three factors: (1) that a large proportion of our cases were inoperable; (2) that we have included all cases treated; (3) that we have not been able to trace a number of the patients treated. Levitt has prepared a table to illustrate these points:—

*Cases treated with X Rays, with or without Radium, by Finzi and Levitt.*

| Total. | Dead. | Living. | Free from disease. Years. | Living with disease. Years. |
|---|---|---|---|---|
| | | | 1. 2. 3. 4. 5. 6. | 1. 2. 3. 4. 5. |
| | | | 8. 9. 8. 4. 5. 1. | 29. 26. 2. 1. 1. |
| 267 | 173 | 94 | 35 | 59 |

The 35 patients are known to be living but most of the 59 when last seen living with disease are now in infirmaries, are too ill to attend, or in some instances have sought relief elsewhere. As they have failed to attend for examination they have been presumed dead for statistical purposes. It is probable, however, that about 30 are still alive. The table is also of interest as showing the marked drop in the survival-rate in and after the third year. A second critical

period has been observed after four years. Considering the large proportion of inoperable cases that we have handed over to Levitt for treatment, I have been greatly impressed by the high percentage of good palliative results that he has obtained by X ray treatments.

### Conclusions.

I believe that there is a great future for radiotherapy if the treatment is properly handled, but we must have special clinics, such as the Radium Institute and Mount Vernon Hospital, richly endowed, vigorously supported by the authorities in control of radium and staffed by groups of expert specialists. I agree with Trotter that radium has not made the surgery of cancer in the throat easier. On the contrary it has made it much more complicated. I doubt the wisdom—I certainly doubt the prudence—of any surgeon employing radium without the help of a group of experts. It is equally certain that the patient ought not to be handed over to the pure radiotherapist who has no clinical knowledge of the disease that requires treatment. The authorities who control radium should do everything in their power to prevent renting agencies from loaning radium to anyone except a recognised expert.

With careful treatment I believe that palliative relief can be afforded by ray treatments to a large percentage of the advanced cases of cancer with very little danger; that it is safer to treat the virulent types of cancer with rays than with surgery alone; and that even early cancers may confidently be treated by irradiation by experts. There is reason to believe that external irradiation will be found to be necessary in nearly all cases before local treatment with radium, but it is not clear at present whether X rays or large quantities of radium will produce the best effects.

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## AN ANALOGY BETWEEN
# EYESTRAIN AND CARDIAC PAIN.

By A. Maitland Ramsay, M.D., LL.D. Glasg.,

FELLOW OF ROYAL FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW; HON. OPHTHALMIC SURGEON, GLASGOW ROYAL INFIRMARY AND OPHTHALMIC INSTITUTE.

Pain is the predominating symptom both in eyestrain and in angina pectoris. Fortunately, however, every pain in the region of the heart is not pathognomonic of true angina pectoris. In certain circumstances pain, typical both in character and in area of distribution, may be complained of by patients in whom no evidence of cardiac disease can be detected. In the heart as in the eye, therefore, pain is symptomatic of several different conditions, each of which must be discovered and removed before relief is possible. Sometimes disordered innervation persists until the pain becomes a habit and the patient a confirmed neurasthenic. In many of these cases no structural disease can be discovered, consequently the invalidism is due entirely to the symptoms. It is well known that a tendency to certain ailments "goes in families," and as vulnerability may be local rather than general, hereditary predisposition plays an important part in determining whether, in the case under consideration, it will be the eye or the heart that is affected. In all likelihood headache will occur in the one case, and cardiac pain in the other, and in both instances the symptom will be either persistent or recurrent.

For our immediate purpose the eye may be regarded as a laboratory in which Nature is the experimenter.[1] The physiology of the ciliary muscle is so well understood that the changes taking place during the act of accommodation can be measured, and as there is a unity in all physiological processes, what can be demonstrated in the ciliary muscle may be assumed to occur in similar circumstances in involuntary muscle in whatever organ of the body it is found. That is the keynote to what follows.

In their functional activities the ciliary muscle and the cardiac muscle present a great similarity. The analogy is both interesting and suggestive. In the eye, just as in the heart, the limits of muscular capacity must be respected. Although the ciliary muscle is in action all through the waking hours, and the heart beats both day and night in an orderly sequence of contractions, yet in neither case is discomfort felt under normal conditions. We never notice things that run like clock-work. In a state of health both the eye and the heart possess a large physiological reserve of strength, which enables them not only to work without discomfort, but also to meet without strain the emergencies of daily life. If the eyes are to do their work in comfort, from one-third to one-half of the power of accommodation and nearly two-thirds of the power of convergence must be in reserve. The physiological reserve power of the heart cannot be calculated so accurately, but everyone who is observant and thoughtful can estimate for himself how much he can do before he feels that he is making an overdraft on his reserve of cardiac energy. This physiological reserve in both eye and heart becomes less as age advances.

### The Nerve Supply.

The autonomic nervous system controls both eye and heart, and the nerve supply of the one bears a striking similarity to that of the other. Both are innervated by a parasympathetic nerve on the one hand, and by the sympathetic on the other. The purpose of this double nerve supply is to bring about a state of equilibrium in the action of the muscle—ciliary or cardiac.

The physiological antagonism between these two units of the autonomic nervous system can be readily studied by observing the contraction and the dilatation of the pupil under the influence of light. The oculomotor and the sympathetic control the iris and the ciliary muscle, while the vagus and the sympathetic regulate the action of the heart. The oculomotor is the parasympathetic nerve for the iris and the ciliary muscle, and the vagus is the parasympathetic nerve for the heart. Contraction of the pupil, due to stimulation of the oculomotor, is analogous, therefore, to slowing of the pulse from the inhibitory action of the vagus, while dilatation of the pupil and rapidity of the pulse are the result of over-action of the sympathetic.

The heart is a single organ, but it carries on a double circulation, and both the right and the left vagus contribute to its nervous supply. On the other hand, each eye is a separate organ anatomically, but physiologically, in the interests of binocular vision, they both work together in perfect unison. The oculomotor supplies not only the ciliary muscle, but also the adductor muscles of the eyeball of its own side, and the nervous control of the two eyes is equal and synchronous. Moreover in the emmetropic eye there is a fixed ratio between accommodation and convergence, and any disturbance in the harmony of this ratio at once gives rise to trouble. The act of accommodation determines the degree of convergence. I shall therefore confine myself in what follows to a consideration of the behaviour of the ciliary muscle.

It is true that there is in the eye nothing structurally comparable with the conducting system in the heart, but functionally the musculature of the iris, of the ciliary body, and of the heart acts by a rhythmical series of contractions and dilatations. In both eye and heart, moreover, the nervous arrangements have been so planned that, through the sympathetic-parasympathetic balance, response to the requirements of the body is rendered immediate and effective. We cannot argue a physiological problem from the standpoint of pure anatomy without danger of falling into error. The distinction between a static condition and a kinetic condition is fundamental.

The evidence of pharmacology [2] goes far to confirm the physiological antagonism of the sympathetic and parasympathetic nerves. Each of these two groups forms a homogeneous whole, and a drug which acts on sympathetic nerves rarely has any action on parasympathetic nerves, and vice versa. Moreover, a drug which acts on the sympathetic nerve to one organ usually acts in a similar fashion on sympathetic nerves in all organs, and the same holds good of the action of drugs on parasympathetic nerves. A solution of cocaine instilled into the conjunctival sac stimulates the sympathetic nerves supplying the dilator fibres of the iris, and causes dilatation of the pupil. Adrenalin is another drug which produces effects identical with sympathetic stimulation of involuntary muscle. When injected intravenously it not only dilates the pupil by stimulating the sympathetic terminals of the dilator pupillæ, but it also stimulates the whole sympathetic nervous system, and quickens the action of the heart. Atropine, on the other hand, has no action upon the sympathetic, but has a profound influence upon the parasympathetic nervous system. It paralyses the oculomotor nerve, causing dilatation of the pupil and loss of the power of accommodation, and by its action on the vagus the heart beats more and more quickly and feebly until at length it stops in diastole. In both eye and heart the drug acts by paralysing the neuromuscular termination of parasympathetic nerves, thereby lessening or abolishing their inhibitory control.

In the eye, physostigmine is the physiological antagonist to atropine. Physostigmine stimulates and increases the excitability of the oculomotor system. It acts on the eye when applied to the conjunctiva, contracting the pupil and causing spasm of the ciliary muscle, thereby fixing the accommodation at the focus for short distance. In some instances it produces such powerful tonic contraction of the iris and ciliary muscle that patients complain of severe pain in and around the eye. That obviously is a serious drawback to its use, and in practice physostigmine is almost invariably combined with its physiological antagonist, cocaine, when the overaction of physostigmine on the parasympathetic is counterbalanced by the compensatory action of cocaine on the sympathetic. This action of cocaine can be easily demonstrated in an eye of which the pupil has been dilated by atropine. It will be seen that the mydriasis is increased after instillation of cocaine. The explanation is obvious. Atropine paralyses the constrictor muscle of the iris, and cocaine stimulates the dilator. The physiological antagonism of therapeutic agents has often to be called into play in the successful treatment of disease. In many instances painful symptoms, due to a failure in the sympathetic-parasympathetic balance, can only be relieved after equilibrium has been restored. Digitalis has an action on the heart similar to that of physostigmine upon the eye. It increases the excitability of the vagus, thereby slowing the contraction of the heart. In an overdose it causes prolongation of systole with shortening of diastole until at length the heart ceases to beat and stops in systole.

### The Pain of Eyestrain.

For our immediate purpose the cases of eyestrain [3] that are most suggestive are those in which the local manifestations are slight or absent, but in which any attempt to read or to sew is followed by severe headache. This is probably the most frequent symptom of eyestrain. The patients as a rule give a very graphic description of their suffering, but rarely make any complaint of defective vision. The headache may be dull and throbbing or acute and neuralgic. It is usually associated with the use of the eyes, and reaches its climax after a day's work; it may be constant or periodic, is frequently frontal just above the eyebrows, but may be occipital, or in the nape of the neck, radiating down the back and along the arm, while at other times the area of maximum severity is the vertex or the temple. The pain is often accompanied by hyperæsthesia and hyperalgesia of the scalp; patients dread brushing their hair, and women cannot bear the discomfort due to hairpins. Frequently very acute pain is caused by pressure upon the supra-orbital nerve as it emerges from its foramen in the upper margin of the orbit.

Concomitant symptoms are numerous, and include diplopia, flashing lights, partial blindness, nausea, retching, and persistent vomiting. Other patients complain of palpitation, of general nervousness, of want of the power of mental concentration, of irritability of temper, of drowsiness alternating with sleeplessness, and of numerous other functional disorders which, although reflex in origin, simulate organic disease so closely that diagnosis is often extremely difficult.

All who are living too freely upon the margin of their reserve strength are liable to suffer from these evil results of eyestrain, but the chief sufferers are young men or women of a neurotic temperament. It is easy to understand how in such patients impairment of general health, or a slight and latent error of refraction, is capable of inducing sufficient irritation to determine a nerve storm such as has been described, and how the constant repetition of these acute attacks may lead up to a condition of pronounced neurasthenia. That unfortunate result is well illustrated by a group of cases in which the patients, who are usually women, complain that every attempt to use the eyes is accompanied by unspeakable discomfort. The symptoms are so distressing that the patient shuns the light, says she is quite unable to read, and in many instances abandons the attempt to take any active part in life. She thinks and speaks of little else than her ocular troubles, and becomes completely absorbed in the observation of her symptoms. In these cases eyestrain is aggravated by a pathological attitude of mind, but it must not be concluded that the distress is imaginary. On the contrary, in the great majority of cases it is very real and very intense. The reality of the suffering makes it extremely difficult to withdraw the mind from it, but unless that can be done treatment will be of little avail. The doctor must understand the psychology of the disease. He must be able to inspire the patient with confidence, and to convince her that she will make a complete recovery.

The action of physostigmine in causing spasmodic contraction of the musculature of the eye explains how severe pain is produced in other organs in which involuntary muscle exists. The nervous mechanism for the production both of ocular pain and of cardiac

pain is present in everyone, but in health no discomfort is felt. When pain is produced it is as a rule not the mechanism, but the exciting cause that is responsible, and in many instances it acts at a distance from the organ affected. The nature and the location of the exciting cause are very important factors in determining the significance of both ocular and cardiac pain. Neither in the eye nor in the heart is the severity of the pain or its area of distribution any guide in differential diagnosis, or in estimating the gravity of the prognosis. Danger cannot be measured by these signs. It depends wholly on the nature of the exciting cause, and whether that cause is situated outside or inside the eye or the heart. So far as the eye is concerned I have the impression that the more easily pain can be elicited by pressure over the supra-orbital nerve the more likely is the cause of the trouble to be found operating from a source outside the eyeball—that is to say, the patient is suffering from ocular strain rather than from intra-ocular disease.

### Disturbance of Motor Power.

In every organ in which involuntary muscle is an important constituent, disturbance in motor power is the most serious thing that can happen to it. In that respect there is, as we have seen, a close analogy between the ciliary muscle and the cardiac muscle. In this connexion it is important to remember that, although an individual has no direct control over the action of either his ciliary or his cardiac muscle, yet he has complete control over conditions which lead to over-action of these muscles. It may be said, therefore, that both the ciliary muscle and the cardiac muscle can be forced by an effort of the will to continue working after nature has called out for a rest. This is a grave source of danger. In the healthy eye the ciliary muscle possesses a marvellous adaptability to meet the constant readjustments necessary to ensure clear vision at varying distances, and in the normal heart the cardiac muscle is capable of maintaining a circulation that can meet without discomfort the many strains incident to a vigorous life. Signs of distress, however, appear at once whenever the demands are so excessive that the muscle-fibres cannot work in relays [4] and all become tired out at the same time: pain and difficulty in reading or sewing in the case of the eye; pain and breathlessness on slight exertion in the case of the heart. It is characteristic of these symptoms, both in the eye and in the heart, that they are precipitated by effort and pass off with rest.

The physiology of accommodation is so well understood that the analogy is helpful to a proper understanding of the mechanism of the production of cardiac pain. It is well known, for example, that many typists, seamstresses, engravers, and all those engaged in similar occupations, are more short-sighted in the evening than they are in the morning. Their work requires them to use their eyes continuously at very short focus. So much so that many of them are apt to complain of frontal headache, and of inability to see properly in the distance when they look up from their exacting duties. The symptoms, as a rule, are most severe at the end of the day, and become worse towards the end of the week; but they are usually relieved after a night's sound sleep, and frequently disappear completely after a few days' holiday spent in the open air. In these circumstances the headache is obviously due to the close application of the eyes to the work, and the association of the acquired myopia gives a clue to a proper understanding of the mechanism of its production. The nature of the patient's employment demands a strong and long-continued effort of accommodation, with the result that the circular fibres of the ciliary muscle become exhausted. In the effort to continue the work they contract spasmodically. The contraction is tonic, consequently the muscle, being in a state of cramp, is unable to relax properly at the end of the day when, work being finished, the patient raises his eyes to look round about him.

What happens in such cases is that the influence of the oculomotor nerve is so powerful that it persists after close work has been discontinued. Normal balance is in consequence completely upset, and the sympathetic is unable, by stimulating the dilator fibres, to bring the circular fibres of the ciliary muscle to rest. If the oculomotor be paralysed by atropine, the power is transferred to the sympathetic, with the result that pain is relieved and the patient can now see in the distance, but he cannot see to do his work. When the effect of the atropine wears off, equilibrium will be restored, but it will not be maintained and the pain will recur after work is resumed unless a suitable lens is worn in front of the cornea to supplement the power of the ciliary muscle. The cause of the symptoms, therefore, is an upset in the sympathetic-parasympathetic balance, and equilibrium must be re-established before they can be relieved.

These symptoms of ocular strain are the result of overwork and, since in the heart the nervous mechanism for the production of pain is similar to that in the eye, cardiac pain will also arise as a result of overwork. For example, a boy exerts his strength to the utmost in his efforts to win a race, or an elderly man hurries unduly in an attempt to catch a train. As a result of the over-exertion both of them may be pulled up suddenly by the onset of acute cardiac pain, which in many instances is difficult to differentiate clinically from the pain of true angina pectoris. In both the boy and the man the heart muscle has been seriously over-taxed, but in neither case is it structurally diseased. All that is necessary in order to relieve the symptoms, therefore, is to give the heart physiological rest. As has been already said, there is a unity in all physiological and pathological processes; consequently if a definite reaction can be demonstrated in the ciliary muscle, it is reasonable to assume that it will also take place, in similar circumstances, in the heart and in other regions of the body of which involuntary muscle forms a component part. It may be objected that the fibres of the cardiac muscle are striated while those of the ciliary muscle are non-striated, but whatever difference striation may make to the functional activity of the heart muscle it does not affect its involuntary character. It should be remembered, moreover, that the ciliary muscle is striated in birds.

Clifford Allbutt [5] has drawn attention to the fact that the most frequent accompaniments of disordered innervation of the stomach are migraine and pseudo-angina pectoris. Hyperæsthesia of the stomach is the predisposing cause, and in some cases it is so sensitive that the patient can precipitate an attack of cardiac pain by taking a copious draught of cold water—an experience analogous to the acute pain in the eye and head from which some suffer when eating an ice. In ordinary circumstances, however, fatigue, anxiety, or annoyance has more to do with the onset of an attack than any indiscretion in eating or drinking. It is well known that, in some people who are highly nervous and over-strung, excitement may bring on an attack of violent sickness; and the same emotional disturbance which will produce gastric symptoms in one

may cause migraine in another, while in a third it may give rise to severe cardiac pain. Severe flatulence and excessive acidity are constant symptoms. As a rule pain is alleviated as the "wind begins to move," and the attack is usually followed by the passing of a large quantity of pale urine.

### Toxæmia.

In these cases the pain is due to a greatly exaggerated reflex, which may be the only abnormality present. In cases both of migraine and of cardiac pain, however, the increased sensitiveness of the nerves of the stomach may be complicated by chronic toxæmias.[6] Of the poisons which affect both the eye and the heart, tobacco is the most familiar. Some patients know, as a result of experience, that they are sure to suffer from cardiac pain during the night if they smoke a cigar after dinner. In like manner some of those who have an idiosyncrasy for tobacco are liable to suffer from a form of migraine when they are obliged to travel in a smoking compartment, or to sit in a room in which others are smoking. In the group of cases under our immediate consideration, however, the more subtle toxins, developed as a result of gastro-duodenal dyspepsia, are more likely to be responsible for the symptoms.

A toxin circulating in the blood may cause spasm of blood-vessels, and this spasmodic contraction can be demonstrated in the retinal vessels with the ophthalmoscope. The pallor of the skin of the face, so characteristic of the onset of an attack of migraine, is obviously due to vasomotor disturbance; and a localised spasm of the cerebral vessels explains the occurrence of the visual symptoms, the transient loss of memory, the temporary aphasia and the mental confusion which are occasionally met with in that disease. There is no reason to suppose that the coronary arteries are exempt from spasm. The patients are almost invariably of a highly nervous temperament, and are usually aware of a family tendency to disease of the stomach or heart. It is easy to understand how in a neurotic person any circulatory disturbance will readily cause an upset in the sympathetic-parasympathetic balance which, in the case of the oculomotor nerve, is referred to the distribution of the ophthalmic division of the trigeminus and, in the case of the vagus, to the area of distribution of the cervical and upper dorsal nerves. It has been said already that pain due to overstimulation of the parasympathetic is relieved by atropine, but in these toxic patients the relief is only temporary. Until the source of the toxæmia has been discovered and eradicated, the pain continues to recur. The eye or the heart is "in the grip of a toxin," and the future progress of the patient depends upon the elimination of the poison. To recognise the reason is always the first step towards any real cure.

### Differential Diagnosis.

In eyestrain due simply to an error of refraction, relief is obtained whenever suitable spectacles are worn, but if the patient be suffering also from any form of toxæmia, the prescription of spectacles is not by itself sufficient to effect a cure. It is very important, therefore, to be able to distinguish this group of cases. One of the most helpful diagnostic signs is the want of translucency in the ophthalmoscopic picture of the fundus oculi; but as a rule the patients' accounts of their symptoms are very suggestive. They complain that the headache is always worst in the morning on awakening from sleep, and that they suffer from glare, and occasional bright flashes when the eyes are exposed to light, especially when they try to read or sew by electric light. They may also say that when they attempt to read the eyes ache so acutely that they feel impelled to desist, but that if they make up their mind to persevere in spite of the discomfort, the pain gradually passes off, and they can continue with comparative ease. It is interesting that in the great majority of those patients, who, by persisting, are able to overcome the pain, the eyes are emmetropic. If any manifest error of refraction be present the patient is quite unable to continue reading after the eyes break down; he can do nothing until he gets proper spectacles.

Some who suffer from cardiac pain tell a similar story. They are pulled up at once if they attempt to walk in the cold or after a meal; but, if they quietly persist, the pain passes off and they are surprised how much they can do without any recurrence of discomfort. To be able to overcome the cardiac pain while continuing exercise is an important point for consideration in an individual case, because in true angina pectoris the seizures are as a rule directly dependent upon exertion, and the patient is compelled to remain quite still, afraid to move until the attack passes. A headache which is felt on awaking from sleep is much more likely to be due to a toxin circulating in the blood than to eyestrain. Similarly cardiac pain which comes on while the patient is at rest is usually at the outset secondary to a toxic or nervous cause, rather than the result of a structural defect in the heart muscle. In these cases physical examination reveals that the heart is normal in size and position, that the vessels are free from disease, and that the blood pressure is either normal or not materially increased.

In those who suffer from a toxic form of either ocular strain or cardiac distress an examination of the urine usually reveals evidence of faulty metabolism. There is disturbance in the normal ratio between specific gravity and output and, when a specimen has been allowed to stand overnight, a microscopic examination of the deposit shows urates or crystals of uric acid or of oxalate of lime. Search should also be made for a focus of septic infection in teeth, tonsils, antrum, appendix, gall-bladder, or prostate gland. Evidence of bacterial infection may be found where the urine shows no signs of disordered metabolism. In some cases the symptoms subside after the source of infection has been removed by a surgical operation. The important fact to recognise in all these cases is that neither in the eye nor in the heart is the cause of the symptoms to be found in the organ of which the patient is complaining. It proceeds from nervous and circulatory disturbance, due either to an error of metabolism or to absorption from a septic source at a distance. If the underlying cause can be discovered and removed by suitable treatment, the patient will very likely obtain permanent relief; but if the explanation of the production of the pain be misunderstood he will be kept miserable and apprehensive by the regularly recurring attacks. These patients, moreover, almost invariably consider it necessary to diet themselves, and as for them dieting consists mainly in restricting both the variety and the quantity of the food taken, their health soon suffers from want of nourishment, and the heart muscle shares in the general enfeeblement. Want of strength makes it necessary to curtail their activities and to deny themselves many pleasures, but in spite of every sacrifice they grow steadily worse. The pain becomes more frequent and more severe with the increasing debility; many of them become confirmed neurasthenics.

## Prognosis.

It is a well-known medical axiom that disease has a psychological as well as a pathological aspect. The evil results of a morbid psychology on the symptoms of eyestrain have already been described. The patient is so obsessed by her visual discomforts that she wears dark glasses constantly, and makes no effort to use her eyes, notwithstanding the fact that they are structurally sound and that any error of refraction has been corrected. No matter how often it has been contradicted, she constantly reminds herself of the unfavourable prognosis she got from a doctor many years previously, and no one can persuade her to modify the restrictions placed on the use of her sight imposed at that time. Mackenzie,[7] writing about cardiac pain, says: "the injudicious prognosis of a doctor may have calamitous results," and adds that "he should not only consider his words, but also his method of expression," and "should weigh carefully the effect of his prognosis upon his patient." In the management of the patient, therefore, good judgment on the part of the physician is equal in importance to his medical skill. He should never forget to study the personality of the individual patient. I do not know of any case in which it has been proved, but it is not improbable that, as a result of an unfavourable prognosis, thoughtlessly given, what at the outset was nothing more than an abnormal reflex may terminate as a case of genuine angina pectoris owing to the debilitating influences which years of bad health, and the constant apprehension of evil to come, have had upon the integrity of the cardiac muscle. I am well aware of the danger of hasty generalisation, but, if the analogy between the ciliary muscle and the cardiac muscle be sound, it is legitimate to conclude that a patient is not suffering from true angina pectoris if (1) he has been complaining of cardiac pain for several years, and if (2) after that interval of time the heart on careful examination shows no sign of enlargement.

The prognosis is very much more serious when the cause of the pain in the eye or in the heart does not operate from a distance, but is located within the organ itself, for example the pathological changes in the eye incident to chronic glaucoma,[8] and atheroma of the coronary artery in the heart. Both these diseases are the result of degenerative changes; consequently they are met with very seldom in the young, but occur most frequently in patients over 40 years of age, and on the whole men are the chief sufferers. Although some cases of chronic glaucoma are characterised by the complete absence of pain during the whole course of the disease, many present symptoms of eyestrain especially in their initial stages. The patients, as a rule, are presbyopic, and consult an ophthalmic surgeon on account of increasing difficulty in seeing to read, and many also complain of pain in the eyeball and forehead. The symptoms, although relieved by the use of spectacles, tend after a time to recur, and to be accompanied in many instances by attacks of mistiness of vision. The patient complains that at times, when he is suffering pain, everything he looks at is seen through a cloud of smoke; and that a light seems to be surrounded by rainbow haloes. When an ophthalmologist learns of those symptoms he knows that he has to deal with a condition much more serious than eyestrain.

In like manner some cases of atheroma of the coronary artery are unaccompanied by pain—angina sine dolore (Gairdner)—but in the majority the patient suffers from præcordial pain after moderate exertion, while in the intervals between the attacks he feels perfectly well. During a seizure the pain may be agonising, and darts in characteristic fashion down the inner side of the left arm. The cardiologist knows, however, that the gravity of the symptom depends neither upon the pain nor upon its area of distribution, but he scents danger whenever the patient complains of breathlessness, and when he describes the pain as an overwhelming sense of impending dissolution.[9]

It is very important to assess the proper value of the symptoms both in the eye and in the heart, because if the patient be examined during an interval between attacks nothing abnormal may be detected. It is only when he is seen during a seizure that there is likely to be an increase in intra-ocular tension, and that a variation in blood pressure is likely to be found in a considerable proportion of the cases of cardiac pain. It is well known that, even in a state of health, both intra-ocular tension and blood pressure vary from time to time, but a persistent tendency towards hypertension or hypotension in either ought always to be regarded with suspicion, and as a "shadow of trouble to come." When left to themselves, both chronic glaucoma and atheroma of the coronary artery pursue a relentless course, and terminate in blindness, or in death, which frequently occurs with tragic suddenness. In the early days of both of these diseases there is usually considerable difficulty in immediate diagnosis, and especially in prognosis. These difficulties, however, ought never to be made an excuse for any delay in treatment, which should always be begun at the earliest possible moment. Clifford Allbutt used to say, "Give your prognosis in heart disease on the best suppositions: treat your patient on the worst." A similar aphorism may be applied to chronic glaucoma.

In both the eye and the heart the prognosis must be based upon an estimate of the amount of structural damage. If structure has been destroyed it cannot be renewed. The architecture of the different organs of the body makes it necessary to have many anatomical modifications, and the functional requirements of individual organs call for highly specialised biological adaptations of structure, for example transparency in the eye, and innate power of rhythmical contractility entirely independent of nerves in the heart. Nevertheless, one and the same physiological process is at work in each and all. So far as working capacity is concerned, therefore, the functioning unit is the most important part of the structure of the individual organ, and danger threatens whenever a sufficient number of these functioning units are injured or destroyed. When dealing with disease, therefore, it is necessary to try to assess the value of the hidden reserve of functioning units of the organ. In those with which we are immediately concerned, attention must be given to the layer of rods and cones of the retina in the eye, and to the muscular fibres in the heart. Damage of the eye may be detected before unequivocal signs of chronic glaucoma are present, by the discovery of a diminution of the light sense, and of characteristic defects in the field of vision. Failure in the power of the heart muscle cannot be measured and charted with the same precision, but, as Mackenzie always insisted, its response to effort in the ordinary daily life of the individual patient may be taken as a reliable guide in forming an opinion of its functional activity.

## Treatment.

Treatment in every case must be determined by the following general instructions: (1) to adopt means to rectify faulty metabolism, and to eradicate every source of septic infection; and (2) to endeavour, in the eye, to stabilise intra-ocular tension at as near

the normal level as possible, and, in the heart, to try to increase the energy of the cardiac muscle.

Errors of refraction, more especially hypermetropia and astigmatism, in a great majority of cases are the determining cause of symptoms of eyestrain, just as high blood pressure, valvular defects, and arteriosclerosis favour the onset of the signs of cardiac distress. As far as I know, the ciliary muscle never becomes hypertrophied in the emmetropic eye. Its working capacity, in these circumstances, is wholly dependent upon the age of the patient and the state of the general health. In these respects it is analogous to the normal heart, which does not increase in size under physiological conditions. It may be said therefore that, although its power of contraction is strengthened by exercise, involuntary muscle does not hypertrophy in normal circumstances.

Nature tries to overcome abnormal conditions both in the eye and in the heart, however, by hypertrophy of the ciliary muscle on the one hand, and of the cardiac muscle on the other. A study of the development of the ciliary muscle proves that the growth of its circular fibres is the natural result of response to effort. In moderate and high degrees of myopia, where there is no need to accommodate in order to see objects near at hand, the circular fibres are poorly developed; whereas in hypermetropia the demands made upon the ciliary muscle are so constant that it rapidly becomes hypertrophied. In the eye, so far as hypertrophy of the ciliary muscle is concerned, we have a well-authenticated and verifiable fact, which in many respects has the value of an actual experiment.

A healthy hypermetrope, who does not make excessive demands upon his eyes, is often able to read or write without any help from spectacles for years longer than the error of refraction would lead us to expect. The onset of presbyopia is postponed. A hypertrophied ciliary muscle, however, resembles a hypertrophied heart inasmuch as it is more liable than normal muscle to break down under strain, or when the general health becomes impaired. On the other hand, if anyone with the same amount of hypermetropia, having reached an age when he thinks that he ought to be wearing glasses, takes to their use, he will find after a few weeks that he cannot read without them. The obvious explanation is that, having been relieved of extra work by the aid of spectacles, the hypertrophied ciliary muscle rapidly deteriorates and loses power until it is unable to overtake more work than is necessary under the new optical conditions. It is well known that if hypertrophied muscle is not kept in constant use it breaks down from fatty degeneration,[10] and neither the ciliary muscle nor the cardiac muscle is any exception to that rule. If, therefore, hypertrophied muscle is to be kept in a healthy condition, exercise is necessary both for the eye and for the heart. The lesson to be learnt from the mechanism of accommodation, therefore, is that, if those who suffer from hypertrophy of the heart be free from pain, breathlessness, and other symptoms of cardiac distress, they ought not to lead a sheltered life, and be told to take great care of themselves, but should be encouraged to find out what they are able to do, and told not to be afraid to do it.

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*(Continued at foot of next column.)*

# RUPTURE OF OVARIAN BLOOD-CYSTS SIMULATING ACUTE APPENDICITIS.

By R. Hodgson Boggon, M.S. Lond., F.R.C.S. Eng.,
CHIEF ASSISTANT, SURGICAL UNIT, ST. THOMAS'S HOSPITAL;
AND
A. J. Wrigley, M.D. Lond., F.R.C.S. Eng.,
CHIEF ASSISTANT, OBSTETRICAL AND GYNÆCOLOGICAL DEPARTMENT, ST. THOMAS'S HOSPITAL.

Rupture of a blood-cyst of ovary is a condition which simulates in many respects the symptoms and signs of acute appendicitis. Though since 1905 attention has been drawn to it from time to time, this fact does not appear to be widely appreciated. Furthermore, it is held that the condition of hæmorrhage from the ovary deserves more careful consideration in the differential diagnosis of acute appendicitis.

H. W. Wilson [1] first noted the similarity in the symptomatology of the two conditions. Novak [2] was able to find 40 cases recorded in the literature up to 1917, and Moore [3] supplies a further 14 in 1922. Brakeley and Farr [4] published accounts of 14 cases that came under their notice between 1914 and 1925. Among many reports of isolated cases are those of Odermatt [5] and Eick.[6] In 1928 R. K. Wilson [7] recorded a series of seven cases.

The following observations were made from the data of some 13 cases admitted to St. Thomas's Hospital between 1927-1930 inclusive, all of which came to our notice, and four of which were operated upon by one of us (R. H. B.). In no case was the pre-operative diagnosis of acute appendicitis really in doubt, and in no case was the operation by nature of an exploratory laparotomy for a condition possessing the somewhat ambiguous diagnosis of, for example, "an acute abdomen."

CLINICAL HISTORIES.

Case 1.—Aged 35, single. Three years' intermittent attacks of abdominal pain. For the last three days severe abdominal pain. No vomiting. Bowels regular. Temperature 99° F. Pulse-rate 104. Rigidity and tenderness in the right lower quadrant of the abdomen. At operation a right ruptured ovarian blood cyst was found and removed. Pathological report: hæmorrhage into fibrous wall.

Case 2.—Aged 18, single. Three previous attacks of pain in lower abdomen. Present history: 36 hours' abdominal pain and vomiting. Bowels constipated. Temperature 98° F. Pulse-rate 96. Generalised tenderness, most marked in left lower quadrant. Ruptured left ovarian cyst found and removed. Pathological report: simple ovarian cyst.

Case 3.—Aged 26, single. Three attacks of abdominal pain during the last ten months. Present history of 12 hours' abdominal pain all over abdomen, associated with vomiting. Bowels regular. Temperature 101° F. Pulse-rate 100. Furred, moist tongue. Generalised abdominal tenderness, greatest in right lower quadrant. Ruptured blood-cyst of ovary removed. Pathological report: fibrous wall.

Case 4.—Aged 24, single. History of painful menorrhagia; 55 hours' acute abdominal pain in lower abdomen. Bowels regular. Vomited twice. Temperature 98·7° F. Pulse-rate 100. Tender and rigid in right iliac fossa. At operation a ruptured blood-cyst of ovary on the left side was found.

Case 5.—Aged 32, single. Previous history of dysmenorrhœa; 21 hours' acute abdominal pain commenced when

*(Continued from previous column.)*

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dancing. Bowels constipated. Vomited on three occasions. Temperature 99° F. Pulse-rate 84. Tenderness and rigidity most marked in right iliac fossa. At operation a right ruptured ovarian blood-cyst was removed. Pathological report: hæmorrhage and fibrosis of wall.

CASE 6.—Aged 34, married. Myomectomy five years previously; 24 hours' acute pain in abdomen, which "doubled her up." Bowels regular. No vomiting. Temperature 99° F. Pulse-rate 104. Rigidity and tenderness in right iliac fossa. Ruptured ovarian blood-cyst on the right side found at operation.

CASE 7.—Aged 27, married. For 14 months had attacks of abdominal pain every eight weeks; 24 hours' history of severe lower right-sided abdominal pain with diarrhœa. Temperature 99·2° F. Pulse-rate 88. Tender and rigid in right lower quadrant of abdomen. At operation a right ruptured ovarian cyst was discovered.

CASE 8.—Aged 22, single. No previous attacks; 12 hours' severe abdominal pain. No vomiting. Bowels regular. Temperature 97° F. Pulse-rate 96. Tenderness and rigidity in right iliac fossa. Right ovarian blood-cyst found. Microscopy showed lutein tissue and hæmorrhage.

CASE 9.—Aged 33, married. No previous history; 12 hours' abdominal pain and diarrhœa. Vomited. Tenderness and rigidity of lower abdomen, right side more affected than left. At operation a blood-cyst of right ovary was found but not removed.

CASE 10.—Aged 39, married. Several previous attacks; 24 hours' sudden onset of acute abdominal pain. Bowels regular. Temperature 100° F. Pulse-rate 120. Extreme tenderness in right iliac fossa, and a certain amount on the left side. Small blood-cyst of left ovary was found at operation, which had ruptured. Microscopy: old and recent hæmorrhage in the ovary.

CASE 11.—Aged 24, single. No previous history; 48 hours' abdominal pain, localised to right iliac fossa. Temperature 99·6° F. Pulse-rate 100. Tenderness and slight rigidity in right iliac fossa. Small ruptured right ovarian blood-cyst discovered at operation.

CASE 12.—Aged 46, married. No previous history; 36 hours' abdominal pain confined to the right side. Temperature 98·6° F. Pulse-rate 64. Rigidity and tenderness in right lower quadrant of abdomen. A ruptured right ovarian blood-cyst was removed. No microscopy.

CASE 13.—Aged 27, single. One previous attack 18 months ago; three days' intense abdominal pain. Bowels regular. Vomited several times. Temperature 99·4° F. Pulse-rate 92. Tenderness and rigidity in right iliac fossa. Ruptured right ovarian blood-cyst discovered at operation.

In all of these patients there was no obvious disease of the appendix present, and in all 13 instances the symptoms had been produced by a rupture of a hæmorrhagic cyst of the ovary. The appendix was removed en passant, however, in all but one patient. The result in all cases was good, an uninterrupted recovery followed this line of treatment.

The average duration of symptoms prior to operation was just under two days, the mean being 34·5 hours. The shortest time was 12 hours, and three days was the longest.

With regard to the age of these patients, the youngest was 18 years of age and the eldest 46 years. The average was worked out to be 27·7 years, and thus it is seen that it is commonly a disease of young women, a view which was shared by H. W. Wilson,[1] who believed that the rupture occurred in ovaries at the height of their functional activity. There appeared to be no definite relation to marriage, for eight patients were single and five were married.

The sudden onset of the abdominal pain and its association with mild trauma is too common to be ignored. It occurred, for example, while "at work," "when dancing," "on return from work," "when reaching for something," &c. Primrose,[8] Novak,[2] and Crousse[9] have also noted this fact, while R. K. Wilson[7] was unable to associate the onset with any muscular effort. No fewer than seven of the cases had previous attacks of a similar, but evidently of a milder, nature. Two cases complained of dysmenorrhœa, while the rest gave no previous history of menstrual disturbance. At first, generalised abdominal pain was experienced; but in a short time—that is, from one to six hours—it became localised in the lower abdomen. The right lower quadrant was affected in 11 cases and the left only in two. Vomiting occurred in nine cases, and was quite severe in several of these, while in the remainder nausea only was complained of. Constipation was unusual, as it was only noted in three cases. In eight the bowels were open normally, and in two diarrhœa occurred. Headache was not a prominent feature, as in only one case was it a symptom, thus this point is an aid in the differential diagnosis from salpingitis, where headache is both marked and common. Vaginal discharge is not associated with ruptured ovarian cysts, and we were unable to establish any definite relation between the time of rupture and the menstrual cycle.

On examination of these cases the most striking point is the excellent general condition of the patients, as compared with their abdominal signs and symptoms. The patient may have severe abdominal pain, much vomiting, a tender and rigid abdomen, but yet look remarkably fit and well. The temperature is usually in the region of 99° F., but in one patient it reached 101° F. The pulse-rate is proportionately raised, and therefore is not very fast. The variation in our cases was between 64 and 130 beats per minute. The tongue was slightly furred in the majority of cases, but was clean in a few, in contradistinction to acute appendicitis, when a dirty tongue is to be expected.

On abdominal examination, the noticeable points were the marked tenderness and hyperæsthesia, and in many cases this was associated with muscular rigidity. In five cases this tenderness and rigidity were definitely localised in the right iliac fossa, and in the remaining eight the whole of the lower abdomen was affected; but in six of these it was more marked on the right side. Rectal and vaginal examination were found to be of little or no value in the patients on whom they were carried out.

### PATHOLOGY.

At operation it was found that the right ovary was more commonly affected then the left, the ratio being 10:3. In most cases there was a small quantity of blood in the pelvis, and this no doubt is the cause of the abdominal symptoms. In seven patients the offending cyst was removed, while in the rest it was not considered necessary to carry out any radical treatment. Six of the cysts were examined microscopically, and were reported as lutein cyst 1, simple cyst 1, cyst with a fibrous wall 2, and hæmorrhagic cyst 2. In regard to the pathological findings just reported, it is noted that, in every instance, the hæmorrhagic cyst of the ovary that was the cause of the trouble presented the same naked-eye appearance. Thus, the ovary was first seen to be enlarged, and the greater part of the organ appeared distended by a purplish structure. A point of rupture was seen, from which actual bleeding was witnessed in several instances. Section of the purplish structure showed a central core of blood-clot surrounded by a serrated layer of yellowish tissue. We are of the opinion that, notwithstanding the negative character of the pathological reports, in every instance some change in the corpus luteum was the immediate cause of the hæmorrhage. It has been suggested that the pathological process underlying this form of ovarian hæmorrhage is an exaggeration of the normal physiological mechanism of rupture of the Graafian follicle. That

this rupture occurs about the tenth to fourteenth days following the first day of menstruation is now thought to be an established fact, and as no constant relationship between the onset of hæmorrhage from the ovary and the menstrual cycle was apparent in our cases, it is held that the corpus luteum is more likely to be the seat of the trouble than the Graafian follicle.

DIFFERENTIAL DIAGNOSIS.

It is extremely difficult to be able to diagnose these cases with any degree of certainty from acute appendicitis. It requires a very accurate history from the patient, close and careful observation on the part of the surgeon, and an intelligent summing up of the situation before it is possible to do so. The report on these cases shows quite clearly that in not one was the pre-operative diagnosis of ruptured ovarian cyst made, and by reviewing them we considered it might be possible to prevent this occurring in the future.

The history of previous attacks is common to both diseases, and therefore is of little value. The menstrual history, even if it is given accurately by the patient, we found to be of no help. There does not appear to be any distinguishable relationship between the menstrual cycle and the time at which a rupture of a cyst may occur.

With regard to the onset of the symptoms, this is usually stated to have occurred suddenly, and, as has been pointed out above, may be related to trauma. The cyst wall of the corpus luteum presumably either becomes very thin, or a hæmorrhage occurs into it, and some movement, in many cases of a slight nature, then precipitates the rupture. As has already been stated, the following symptoms have been found to be of no aid in the differential diagnosis: that is, vomiting, or condition of bowels. The absence of headache, although of no value in differentiating from appendicitis, is useful as a means of distinguishing from acute salpingitis.

In acute appendicitis it is usual for the pain to be of a dull nature and diffused over the abdomen, later settling in the right iliac fossa, whereas in this condition the abdominal pain, to commence with, is lower abdominal and more severe than in the early stages of acute appendicitis, as the pelvic peritoneum is irritated considerably by the pouring out of blood. On examination of the patient, the most striking point is the fact that the general condition is excellent, in spite of quite well-marked abdominal signs. Even after three days, these patients look remarkably well, when a patient with an inflamed appendix which was not resolving would look extremely ill. The condition of the tongue was too indefinite to be of any great assistance. The alteration of temperature and pulse-rate correspond with what is found in acute appendicitis. On examination of the abdomen, the tenderness is most marked, and almost amounts to hyperæsthesia, but rigidity is not nearly as great as one would expect in a similar case of acute appendicitis. Again, no absolutely definite tender spot is to be found, but the painful area is diffused over one lower quadrant or the whole of the lower abdomen. Rectal or vaginal examination does not cause such discomfort as would be expected with an inflamed appendix lying in the pelvic position.

In conclusion, we would stress the following points, in order to assist in making a diagnosis of ruptured ovarian blood-cyst: the sudden onset of severe lower abdominal pain in relation to slight trauma in a young woman; the good general condition of the patient, in spite of the length of history; and marked lower abdominal tenderness without marked muscular rigidity. The diagnosis of this condition being in the majority of instances uncertain, we should advise an exploratory laparotomy in all cases.

When rupture of this hæmorrhagic condition of the corpus luteum has been discovered at operation, in our opinion the treatment should be the enucleation of the hæmorrhagic area and the closure of the empty space by one or two catgut mattress sutures.

We wish to thank the surgical staff of St. Thomas's Hospital for permission to publish the cases.

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# BRONCHIAL ASTHMA.

## A RECORD OF TWO CASES.

BY P. J. CAMMIDGE, M.D.LOND.

THE following cases appear to be worth recording at the present time, when the biochemical changes associated with allergic diseases, and particularly bronchial asthma, are attracting so much attention, because more exhaustive analyses of the blood, urine, and fæces appear to have been carried out than in any others previously described, as far as I can discover.

CASE 1.—A man of 44, an engineer by profession, was sent to me by Dr. Brown Hearder, of Ilkley, in November, 1930. There was no family history of allergic disease, and the patient himself had been free from symptoms until 1922, when he had been three years in India; he had then begun to have attacks of bronchial asthma which had rapidly increased in frequency and severity. On his return home, in 1924, he underwent an operation on his nose, and for a short time was comparatively free from attacks; later, the symptoms returned with increased severity. The local treatment was repeated with no further benefit in 1928, and in August, 1930, he had all his teeth extracted under a general anæsthetic; ten days later he suffered from the worst attack of asthma he had ever experienced. As his condition interfered very seriously with his occupation, I was asked to investigate the case in the hope that light might be thrown on the metabolic disturbances underlying the symptoms, and that treatment could be devised for dealing with them.

CASE 2.—A woman of 43, was recommended to me by Dr. J. MacKenzie, of St. Anne's-on-Sea. She had experienced her first attack of asthma about three months before I saw her, in August, 1930, and the attacks had rapidly become more serious and frequent. Her niece, a child aged 11, was said to have suffered from asthma from birth.

Both were severe cases, and had developed the disease comparatively late in life, so that they were probably of similar type, although in the second case there was evidence of an inherited tendency which could not be discovered in the other. As the blood analyses of the man were carried out with samples collected during an attack, whereas the corresponding specimens from the woman were taken in a quiescent period, it is interesting to compare the results.

### Biochemical Investigations.

BLOOD.

The findings obtained with samples of blood drawn from a vein after a ten-hours' fast are given in the following Table.

TABLE SHOWING ANALYSES OF WHOLE BLOOD.

| | Case 1. | Case 2. | Normal. |
|---|---|---|---|
| | mg. per cent. | | |
| Non-protein nitrogen | 45·0 | 45·0 | 30–40 |
| Urea nitrogen | 20·0 | 20·0 | 15–20 |
| Uric acid | 9·0 | 9·0 | 1–3·5 |
| Nucleotide nitrogen | 16·0 | 16·0 | 3–5 |
| Ammonia nitrogen | 0·4 | 0·4 | 0·4–0·75 |
| Amino-acid nitrogen | 6·0 | 8·0 | 0–8 |
| Total creatinine | 6·5 | 6·0 | 3–6·5 |
| Preformed creatinine | 1·2 | 1·0 | 0·8–1·2 |
| Total phenols | 1·6 | 6·0 | 0–1·8 |
| Free phenols | 1·4 | 5·0 | 0–1·6 |
| Sugar | 35·0 | 77·0 | 70–100 |
| Acetone bodies | 0·2 | 0·08 | 0–0·04 |
| Oxybutyric acid | 2·0 | 2·0 | 1–2 |
| Lactic acid | 30·0 | 30·0 | 25–30 |
| Cholesterol | 190·0 | 180·0 | 170–200 |
| Sodium | 200·0 | 200·0 | 170–250 |
| Potassium | 180·0 | 192·0 | 150–200 |
| Calcium | 4·5 | 5·0 | 5·3–6·8 |
| Magnesium | 3·0 | 4·5 | 2·3–4·0 |
| Chlorides | 300·0 | 450·0 | 350–500 |
| Total phosphorus | 15·0 | 20·0 | 10–12 |
| Inorganic phosphorus | 5·0 | 5·6 | 4·5–5·5 |
| Inorganic sulphur | 0·7 | 0·8 | 0·5–1·0 |
| Van den Bergh reaction | neg. | neg. | neg. |
| Hæmoglobin (Newcomer) | 95 per cent. | 86 per cent. | 85 per cent. |

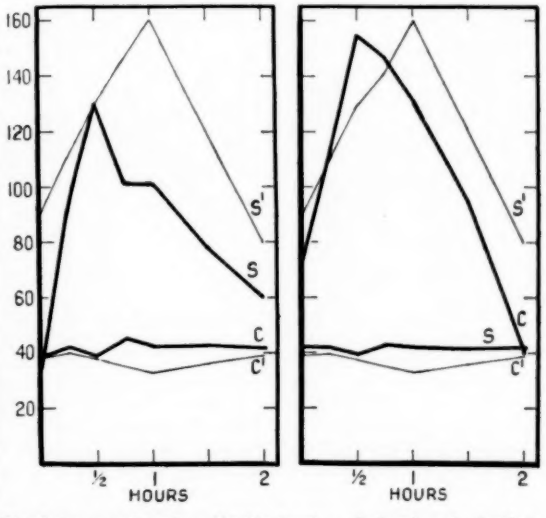
Both patients showed an identical increase in the non-protein nitrogen, uric acid, and nucleotide nitrogen, and a urea nitrogen which was up to the normal limit, but there was no excess of amino-acid nitrogen, such as has been described by Oriel,[1] in some cases of asthma, and the van den Bergh reaction was negative. An abnormal percentage of acetone was found in the blood of both patients, but it was considerably higher in the specimen taken during a paroxysm than in that obtained during a quiescent period, although both showed the same percentage of oxybutyric acid and in neither was there any excess of ammonia nitrogen. A low blood-sugar is known to be a common feature of allergic diseases, and these patients exhibited that abnormality, particularly the one on whom the estimation was made in the course of an attack. Both cases showed a low calcium and an excess of phosphorus, but whereas the blood of the man contained a subnormal percentage of chlorides, this was not the case with the woman; the latter, however, had an excess of magnesium. Billigheimer[2] has drawn attention to the occurrence of a subnormal percentage of calcium in the blood of asthma patients, but the other abnormalities have so far not been reported. It will be noticed that there was a considerable excess of phenols in the second case but not in the first. Although both specimens showed striking variations from the normal, the differences between the two were not very pronounced on the whole. Nevertheless, they were, in all probability, somewhat greater than appears for, while in the second case the hæmoglobin and erythrocyte count were approximately normal (86 per cent. Newcomer, and 4,800,000 per c.mm.), in the first they were distinctly high (95 per cent. Newcomer, and 5,600,000 per c.mm.), thus indicating a concentration of the blood in the latter which should be taken into account in making the comparison.

### GLUCOSE TEST-MEAL.

Immediately after the venous blood had been obtained the patients were given 50 g. of glucose in water by the mouth; samples of blood were taken from finger-pricks for sugar determinations, and specimens of alveolar air were secured for the estimation of the carbon dioxide tension (Haldane) at intervals for two hours. The results are represented in Figs. 1 and 2. In the first case the percentage of sugar in the blood underwent an unusually rapid rise and had attained the normal level at the end of half an hour; then, instead of rising further, it dropped almost as quickly, although it had not returned to the fasting level at the end of the second hour. A similar but less pronounced rise during the first half hour occurred in the second case, and this was followed by an even more rapid fall, so that by the end of the second hour the percentage was considerably lower than it had been fasting.

The carbon dioxide tension of the alveolar air in the first case did not alter appreciably from the normal average during the first half hour, but subsequently, instead of the usual fall, it exhibited a striking rise which carried it well beyond the limit of the normal range, thus suggesting a well-marked alkalosis, which persisted to a lesser extent until the completion of the test. In the second case the carbon dioxide tension of the alveolar air was high before the glucose test-meal was taken, and showed little change, excepting for a slight fall at the half hour when the percentage of sugar in the blood was highest, so that in this instance also there was apparently a well-marked alkalosis.

FIGS. 1 2




Blood-sugar and carbon dioxide tension of alveolar air, fasting and after a test-meal of glucose (50 g.), during an attack of bronchial asthma (Fig. 1), and in a quiescent period (Fig. 2). S = Blood-sugar in mg. per cent. S′ = normal blood-sugar. C = carbon dioxide tension of alveolar air in mm. C′ = normal carbon dioxide tension of alveolar air.

### URINE.

No sugar was found in the urine in either case during the two hours following the glucose test-meal or in a complete 24 hours' collection, but the female patient passed rather more than half a gramme of glycuronic acid, mostly within two hours of glucose being taken, and both excreted an excess of dextrine, 6·3 g. in the first case and 8·5 g. in the second, in the course of the 24 hours. In spite of the abnormal acetone content of the blood in both cases, none was found in the urine, and the total acidity and ammonia nitrogen were within normal limits, but there was an excess of amino-acid nitrogen in both 24-hour collections, 0·12 g. and 0·2 g. respectively. In the first case the phosphates (6 g.), calcium (0·6 g.), and magnesium (0·45 g.)

were high, but there was no excess of chlorides (15 g.); while in the second case, although the calcium excretion was excessive (0·6 g.), the phosphates (3 g.), chlorides (12 g.), and magnesium (0·36 g.) were normal. Qualitative tests gave an abnormal reaction for indole, skatole, and urobilin with the urine of both patients.

FÆCES.

Macroscopic and microscopic examination of the fæces showed no striking abnormality, but chemical tests gave a well-marked reaction for biliverdin and a fair reaction for occult blood in both cases. An abnormal percentage of inorganic ash, 25 per cent. and 20 per cent. respectively, was found in the quantitative examination, also a rather low fat content (12 per cent. and 15 per cent.), with a subnormal percentage of neutral fat (0·4 and 0·3 per cent.) and a high trypsin index, 250 units in both.

## Discussion.

The outstanding features of these cases are, first, the fasting hypoglycæmia, with a relative hyperglycæmia after 50 g. of glucose had been taken and, secondly, the high carbon dioxide tension of the alveolar air, pointing to a well-marked alkalosis. The latter is particularly interesting in view of the theory recently suggested by Beckman,[3] that there is an intimate connexion between the state of allergy and the acid-base balance of the body, the allergic individual being, according to him, "one who stores too much reserve alkali and neutralizes too rapidly or too effectively the acid substances constantly liberated into the blood stream during the course of normal metabolism." Both the cases under consideration seem to support Beckman's theory, for, although the carbon dioxide tension of the alveolar air was not abnormally high in the fasting specimen from the first patient, it must be remembered that he was then suffering from a severe attack of asthma which would, no doubt, temporarily increase the acid products in the blood stream; when he was examined again next day during a quiescent interval, and after a good night, the carbon dioxide stood at the same level—42 mm.—as in the patient who was not suffering from an attack at the time the original estimation was made. In both cases the ingestion of sugar was followed by a brief reduction in the alkalosis, possibly owing to stimulation of the pancreas and a consequent increase in its alkaline secretion, but when the sugar content of the blood diminished and the tissues were probably making use of the sugar as a source of energy, the carbon dioxide increased again, particularly in the first patient whose available carbohydrate was evidently low, judging from the very small percentage found in his fasting blood.

The difference between the fasting blood-sugar levels in the two cases is, no doubt, accounted for—to a large extent at least—by the different conditions under which the samples of blood were obtained, and that this is the case is indicated by the fact that a specimen subsequently taken from the first patient when he was not suffering from an attack was found to contain 70 mg. per cent. of sugar with a hæmoglobin content of 85 per cent. (Newcomer). Experiments I have described elsewhere [4] have shown that a naturally occurring hypoglycæmia in mice is transmitted as a Mendelian recessive character, and there is reason to think this may be true of human beings also,[5] although conclusive evidence of the transmission of a recessive character is difficult to obtain in the human subject. It is suggestive, however, that in one of these cases a blood-relation of the next generation suffered from the same disease as the patient, but at a much earlier age.

Assuming that the hypoglycæmia in the cases under consideration was a sign of an inherited defect of metabolism and that this defect was in some way connected with the allergic condition, it may be asked why the appearance of the symptoms of asthma was delayed until middle life. An explanation is suggested by the character of the blood-sugar curve and the other results of the analyses. In both cases the rapid rise in the sugar content of the blood after glucose had been taken by the mouth indicates an imperfect capacity to store sugar, but, as the excess was rapidly removed after a short latent period, it is evident that the trouble lay in a too-rapid passage of sugar from the hepatic into the systemic circulation; in other words, the relative hyperglycæmia was due to defective functioning of the liver. That the functions of the liver were not being normally carried out was also suggested by the excess of nitrogenous waste products in the blood and the amino-acid excess in the urine. Experiments upon animals and observations on human beings have shown that hypoglycæmia may be a consequence of hepatic insufficiency, and it is therefore not improbable that in both these cases the low blood-sugar was dependent upon liver defects, partly inherited and partly acquired as a result of damage consequent upon the continued action of some toxin. The phenol content of the blood, particularly in the second case, the marked excess of indole and skatole in the urine of both, and the presence of glycuronic acid in the urine of the woman, all point to an intestinal toxæmia, while the pronounced urobilinuria, with the high trypsin index and relatively low percentages of fat in the stools, suggest an infection of the bile and pancreatic ducts with consequent secondary changes in the liver and pancreas. Consistent with these conclusions are the very marked reaction for biliverdin and the excess of inorganic ash given by the fæces, indicating a chronic catarrh of the small and large intestine in both cases.

## Treatment.

The indications for treatment suggested by these findings were, first, to improve the condition of the intestine and control the toxæmia as far as possible; secondly, to raise the sugar content of the blood and increase the functional activity of the liver; and thirdly, to prevent the development of alkalosis. A diet was therefore prescribed as free as could be managed of irritating material and containing an excess of acid-forming, relative to base-forming, constituents. The patients were advised to eat as much dextrinised starch as possible and to take two or three ounces of glucose daily in divided doses, since experiments I described some years ago [6] showed that dextrins improve the functional activity of the liver better than untreated starches, and I have found that when glucose is taken by the mouth there is a pronounced diminution in the excretion of indican in the urine. As the administration of calcium along with glucose has a more beneficial effect than that of glucose alone in experimental liver poisoning, according to Minot and Cutler,[7] and as the blood analysis showed a low percentage of calcium in both cases, they were given calcium lactate in 5-grain doses three times a day in a paraffin emulsion, which also contained sodium benzoate as a mild antiseptic. Finally, with a view to controlling the increase in the alkalosis after meals, ammonium chloride, in 15-grain doses three times a day, was prescribed.

Up to the present, the results of this treatment have been satisfactory on the whole, for the female patient, who had the shorter history, has been free from attacks of asthma since it was commenced and

although the other patient still suffers from occasional attacks, they are less severe and the interval between them has increased considerably, so that, instead of having three or four paroxysms a week requiring adrenalin injections, as was the case before the treatment was commenced, a week or ten days now elapses.

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## ON BIER'S (ARTERIAL) HYPERÆMIC METHOD.

By Arthur Heys, M.B. Edin.,

late hon. medical officer, jersey dispensary and infirmary, jersey, c.i.

The words "arterial hyperæmia" have been used in contradistinction to "obstructive" or "venous," the former being produced by means of hot air, the latter by the elastic bandage or some similar appliance. To employ artificial hyperæmia means to increase the quantity of blood in a given diseased portion of the body, thereby hoping to obtain beneficial results. According to Prof. August Bier, of Berlin, an inflammation in itself ought not to be regarded as a disease, but rather as an attempt of the body to resist the attentions of an invading foe. To increase this inflammatory hyperæmia, resulting from the fight of the living body against the invader, is the aim of Bier's hyperæmic treatment. There are several methods by means of which hyperæmia may be produced: (1) by an elastic band; (2) by cupping glasses; (3) by hot air.

Any part of the body brought near to a source emitting strong heat becomes bright red or hyperæmic. The hyperæmia produced by this method is different from that caused by obstruction. The latter causes what Bier calls a "venous" hyperæmia, the former an arterial one. Heat for the production of hyperæmia has been employed as long as the art of healing has existed. It has been used as poultices, fomentations, sun-baths, sand-baths, mud-baths, Turkish baths, and in the modern electric light baths. I have had a fairly long experience, and can say that the results from the closed-in box are far superior to those from radiant heat, for a steady temperature can be obtained and work is possible in comfort at a much higher temperature.

The increased supply of arterial blood to any part of the body favours the absorption of chronic infiltrations, exudations, and adhesions. These chronic conditions, being the result of some previous acute inflammation, are particularly responsive to hot-air hyperæmia. This alone is a fairly wide field for operation. A great number of cases of old-standing arthritis, for example, whether rheumatic, traumatic, or gouty, which are often very difficult to benefit by the ordinary methods, are quickly relieved and cured by hot-air treatment. A second class of case that can be treated advantageously by hot-air hyperæmia is neuralgia of all varieties. If, as a witty Frenchman has remarked, neuralgia be the "cry of a starved nerve for more blood," there can be no better means of supplying its need than by subjecting it to hot-air treatment. Dry hot air permits the use of a very high temperature without injury or pain to the part to which it is applied. I have often seen the thermometer register 250° F. while the patient felt the reverse of uncomfortable—in fact, often inclined to go to sleep. For practical application in surgery, the hot-air wooden chambers and the hot-air douche are not expensive, and are now obtainable through the majority of English drug houses from abroad.

There are several cardinal rules to be observed in the treatment. The first is that there must be no pain, or even annoyance, from the heat. The second a rule I have found to work well is: the more acute the ailment that is being treated, the lower should be the temperature for a commencement. I usually use 180° F. for a first sitting. Another rule to remember is that, as the temperature of the chambers is highest in the top parts, an asbestos toe-cap should always be used for protecting the toes in the treatment of the lower limbs. Again, it is important to remember to turn on and light the gas before placing it near the closed chamber, or the results might be disastrous to the patient.

### CASES WHERE BIER'S METHOD IS USEFUL.

The powerful effects of the hot-air bath can be made good use of in causing rapid absorption of exudations of blood and serum. It was whilst treating a great many football injuries, more particularly cases of blood and fluid in the various synovial sacs, where rapid absorption was necessary in order to get the player back quickly into the team, I found hot-air treatment could do in almost half the time what would be done by older methods of treatment. Thus in contused limbs and traumatic synovitis due to sprains and other causes, it gives excellent results.

A prominent Burnley player was brought to me some time ago complaining of great pain on putting the foot down. The front of the leg was swollen, tender to the touch, and shiny. He had been kicked in a match, and had had two restless nights. He had the hot-air treatment on three successive days. He played on the fourth day at Huddersfield, and was transferred from Burnley to Huddersfield on the same day for a record fee.

In December, 1930, a married woman, aged 43, fell downstairs and tore the muscle-fibres near the insertion of the left deltoid. She was advised to go to the electrical department of the local hospital. She was treated with diathermy for some time, but the condition did not improve. When she came to me in January of this year, the whole of the muscle was swollen and painful, and the shoulder-joint movements were much restricted. She had Bier's hot-air treatment on alternate days for three weeks and at the end of that time the swelling had gone, the movements were practically normal, and the pain had diappeared.

Another type of injury which I have often had to treat, and which is at times very troublesome, is the stiff joint and œdema of hand or foot which often follows a Colles's or Pott's fracture. If the limb is subjected to a fairly high temperature for a week or two the œdema as a rule disappears quickly, and the adhesions soften and can often be broken down without the aid of chloroform. Even if the latter be necessary, there is not the same inflammatory exudation after the "brisement forcé," more particularly if the hot-air treatment be continued immediately after. One often meets in practice, too, obscure joint pains, where nothing abnormal may be detected, but which are there when the patient comes down heavily, say, with one foot. Perhaps "joint neuralgias" would do for want of a better term. These I have several times seen disappear after two or

three hot-air applications—and the cures have been permanent.

Fractures involving the elbow-joint are often very difficult to treat successfully. There is always risk of stiffness and even ankylosis. By using the hot-air treatment after a week or ten days, fixing the limb alternately in the fully flexed and fairly extended positions, the latter perhaps by weighting the arm at night, allowing the weight to hang over the bed, I have had results which have been, I feel sure, better than I could have obtained by other methods.

Varicose veins—more particularly those cases where the smaller veins are involved, and where ulceration has not taken place—benefit by hot-air treatment, which greatly helps other methods of treatment, such as rest. The œdema yields to the increased circulation and even in bad ulceration the base of the ulcer cleans more rapidly and cicatrisation is hastened. Care must be taken not to use a great heat, for fear of burning (160° is high enough), and to see if there are any signs of a recently formed thrombus, which would contra-indicate hot-air.

But it is principally in cases of commencing osteo- and rheumatoid arthritis that I have had particularly good results with Bier's method. True, their exact cause is still a question of great dispute, but the fact remains that in many cases hot-air has a powerful influence in causing absorption of exudates. Many times I have been able to cure a case of rheumatism which has resisted the usual methods and seemed to be drifting rapidly into the chronic stage.

I have as a periodical patient a doctor's widow with incipient rheumatoid arthritis of the right hand. The interphalangeal joints are swollen and movement is somewhat restricted. She takes guaiacol carbonate regularly and every few months comes for her "baking." She has had, so far, no progression of the disease and always states that the treatment loosens her joints and eases the pain. Even in the more chronic cases of rheumatoid arthritis the pain is greatly eased and life made more bearable.

These cases demand time and confidence on the part of the patient, and patience and perseverance on the part of the doctor.

Many cases of simple neuralgia yield to the hot-air douche (half an hour at a time). In sciatica, where no extraneous cause, such as pelvic pressure or rheumatoid arthritis of the hip, could be discovered, I have had varied results. Many cases have yielded after a few applications; many have gone on apparently no better.

When one considers the extensive use of Bier's hot-air boxes on the continent and in America, it is surprising that so few practitioners avail themselves of them in England. Here in Jersey I have had many patients who have come to me and told me of their having had the same treatment in Switzerland or Germany.

In conclusion, let me add that in Bier's hot air treatment we have a powerful and efficient remedy. His theory that by increasing the volume of the blood alone, Nature's remedy, a cure can be often effected, is sometimes somewhat difficult to believe, but is nearly always borne out in actual practice.

Let me here acknowledge my indebtedness to Dr. W Meyer and Dr. V. Schmieden for many little helps in the actual working of the apparatus, and for hints from their book[1] in drawing up this paper.

[1] Bier's Hyperæmic Treatment, Phil. and London, 1909.

# CLINICAL AND LABORATORY NOTES

## HÆMOPHILIA IN A TWIN.

By M. De Lacey, M.B. Lond.

There are three recorded instances of hæmophilia in twins. In two of them both members were affected, whereas in the other case, one twin was normal and one was affected. The particulars of these are as follows:—

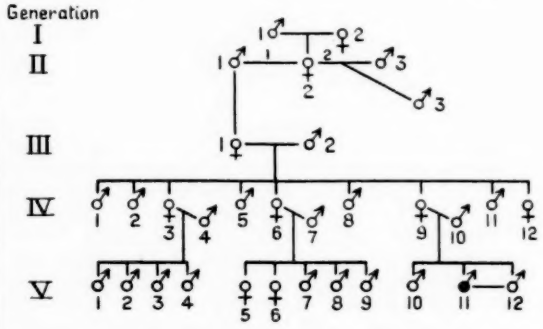
1. *Twins, one normal, one bleeder.*—Reported by E. A. Sadler in *Birmingham Medical Review* (1898, xliv., 45). This is a well-recorded and extensive family (16 cases) of typical bleeders living at Ashbourne, Derbyshire. In the fifth generation there is an instance of twins, one being a bleeder, and the other normal. The normal one died of broncho-pneumonia when 2 years of age, having up to that time shown no tendency to excessive bleeding. His twin brother bruised early, but, chiefly on account of the great care taken of him, did not bleed externally until the age of 11 years, when he bled to death from a cut in the head.

2. *Twins, both bleeders.*—(*a*) Pedigree exhibited by Gould in *Boston Medical and Surgical Journal* (1857, lvi., 500). No details were given by Gould, but the pedigree of these twins figured in Bulloch and Fildes's Monograph, "Treasury of Human Inheritance," 1911, Parts V. and VI., pedigree 538. (*b*) Case reported by Max Fischer (Inaug. Diss., München, 1889). This was the history of a large family in the Würtemberg district of C, near Pforzheim. The facts about these twins were:—

1. *Ludwig Friedrich*, aged 23 years, a severe bleeder. The slightest injury caused great losses of blood. He was exempted from military service, because a wound on his finger bled for six months.

2. *Karl Friedrich*, twin with Ludwig Friedrich. At the age of 9 months, while cutting one of his teeth, a blood vesicle formed, and from it he bled continuously until he eventually died.

In the following case which has come under my care one twin is normal, while the other is a typical




bleeder. The twins are both boys. I have managed to trace the family back for five generations, as the accompanying figure shows, but no other instance of a bleeder can be found in the family.

*Generation I.*—I (2) died at 83 years. Family history not known.

*Generation II.*—II (1). First husband of II (2). II (3) second husband of II (2). II (2) died of cancer, aged 40 years. She had no brothers or sisters.

*Generation III.*—III (1) husband of III (2). III (2) died of apoplexy, aged 72 years. III (3) son of II (2) by II (3), died of a stroke at 54 years. (Not a bleeder.)

*Generation IV.*—IV (1) not a bleeder, aged 62 years. IV (2) not a bleeder, aged 59 years. IV (3) married IV (4). IV (5), aged 51 years, not a bleeder. IV (6) married IV (7). IV (8) died, aged 48 years, not a bleeder. IV (9) mother of twins, one of whom is a bleeder. IV (10) husband of IV (9). IV (11), aged 40 years, not a bleeder. IV (12) died of pneumonia, aged 3 years.

*Generation V.*—V (1), aged 31 years, not a bleeder. V (2), aged 30 years, not a bleeder. V (3), aged 25 years, not a bleeder. V (4) died of measles, aged 2 years, not a bleeder. V (7), aged 10 years, not a bleeder. V (5), V (6), V (8), V (9), stillborn children. V (10), aged 24 years, not a bleeder.

*Twins.*—V (11), Robert A, aged 11 years, bleeder. V (12), Arthur A, aged 11 years, not a bleeder.

*Robert A.*—V (11). Now aged 11 years. At 8 months he had a painful swelling of the right shoulder, which soon got well. At 10 months he bit his tongue with a newly erupted tooth, and the cut bled continuously for one week. At 18 months a cut on the lip bled for one week. Since then this boy has bled on the slightest injury. He has had several attacks of profuse epistaxis, and large spontaneous bruises over different parts of the body. He has had several attacks of hæmorrhage into joints, particularly the elbow and knee, but also the wrist-joints and ankle-joints. There have also been several attacks of melæna, and on different occasions hæmorrhage into the scrotum. At one time he received injections of horse serum, but this was given up because of hæmorrhage at the site of needle punctures. On July 17th of this year he received an injury to his foot, and the resulting wound bled continuously for over a week. On the day following, hæmorrhages under the tongue and into the skin of the arms, chest, abdomen, and thighs showed themselves. The generalised bleeding which occurred on the day following the injury is interesting. It may be that the injury resulted in the production of some substance which diminished the coagulability of the blood, and so caused the scattered hæmorrhages of the next day. This would explain the attacks of bleeding which occur frequently without any apparent cause.

*Arthur A.*—The other twin V (12) has never showed the slightest tendency to bleed unduly.

I should like to express my thanks to Prof. William Bulloch for the interest he has shown in this case, and the help he has given me in regard to the other cases quoted.

Sheerness, Kent.

## A CASE OF CANCRUM ORIS.

By J. J. O'Donoghue, M.R.C.S. Eng.,

LATE HOUSE SURGEON AND HOUSE PHYSICIAN, POPLAR HOSPITAL FOR ACCIDENTS; LATE RECEIVING ROOM OFFICER, LONDON HOSPITAL.

In view of the comparative rarity of cancrum oris nowadays, the following account of a case, which I recently had the opportunity of observing, may be of interest.

The patient, a male infant aged 2 years, was admitted to the Hallam Hospital, West Bromwich, with a diagnosis of broncho-pneumonia following whooping-cough and with a history of also being a measles contact. On examination the diagnosis was amply confirmed, the child being acutely ill and presenting well-marked signs in both lungs; the temperature and the pulse- and respiration-rates were respectively 102·6°, 150, and 80.

On the morning after admission the tip of the nose and central portion of the upper lip were noticed to be swollen and of a deep bluish colour, somewhat resembling a traumatic hæmatoma. There was, however, no history of injury. The same evening the discoloured area had increased in size and involved a wedge-shaped area with its apex at the tip of the nose and extending to the corners of the upper lip. A diagnosis of cancrum oris was then made. By next morning the lower lip had become involved and the affected area was of a dry shrivelled appearance, deep black in colour, and surrounded by a definite red line of demarcation.

During the following day separation of the gangrenous area commenced by a process of ulceration, which began in a small spot near the right nostril and slowly encircled the necrotic area, taking seven days to become complete. During the process the line of ulceration was covered by a black dried-up slough, from under which thin sanious pus kept continually oozing. The complete separation of the nose and upper lip occurred two days in advance of the separation of the lower lip. During this period the child became progressively weaker and more toxæmic and developed an evil-smelling oral discharge. The gangrenous area also had a fœtid odour. When the sloughs had completely separated, the denuded area showed pus and unhealthy looking granulation tissue at its edges.

The child, who had been desperately ill, now underwent a slight but definite improvement and, considering the state of the mouth and nose, its general condition was, if anything, surprisingly good. This improvement was not maintained, however, and the patient gradually grew more exhausted and cyanosed, while toxæmic features became very manifest and about one week later death occurred in the early hours of the morning, approximately 18 days after admission to hospital. There was no post-mortem examination.

The pulse-rate remained at the high figure of 150 throughout the whole illness. The fever was of a hectic type, the temperature falling to 99° or 100° every morning and reaching 102° or 103° in the evening. For the two or three days following the separation of the nose and upper lip it fell slightly but later resumed its previous character which it retained until the end. The respiration-rate during the early part of the illness varied between 60 and 80 per minute. It showed a temporary fall corresponding with the fall in temperature, rose again to 60 per minute for a day or two and finally fell to 40 per minute, at which figure it remained until the termination of the case.

Swabs were taken of the oral discharge and also from the surface of the ulcerated area and on culture a hæmolytic streptococcus of the type beta (Smith and Brown) was isolated.

As regards treatment, it was decided that, in view of the seriousness of the child's chest condition, active surgical intervention was out of the question and the treatment adopted consisted of the application of antiseptic dry dressings and later, fomentations to the affected area, which, along with the mouth, was swabbed and irrigated with hydrogen peroxide at frequent intervals. Brandy and oxygen were administered periodically.

I am indebted to Dr. Douglas Stanley, of Birmingham, for permission to submit these notes for publication.

Bovey Tracey Cottage Hospital.—Miss Violet Wills recently laid the foundation-stone of a new cottage hospital at Bovey Tracey, the site for which has been given by Mrs. Trelawny. There will be two wards of four beds, two private wards, and a theatre, and the cost will be about £3000.

Hospital Extensions.—Lord Derby recently opened a new wing of the Stretford Memorial Hospital, Manchester. The additional wing contains two wards of 16 beds each, one for men and the other for women, four private wards, and a theatre; hitherto male patients have not been admitted. The hospital now has 48 beds, eight of which are reserved for maternity cases.—Mrs. H. K. Stephenson recently opened, and the Bishop of Sheffield dedicated, extensions of the Sheffield Children's Hospital. The work includes improvements in the out-patients' department, the furnishing of a new nurses' home, the reinstatement of a ward used temporarily for ultra-violet light and massage, and the provision of new accommodation for those departments. The improvements have cost £12,000, provided by the sale of securities entailing a reduction of the annual income by more than £500.—A new ward of four beds at Swanage Cottage Hospital has been opened by Sir Ernest Scott. It is intended for special treatment and emergency cases.

# MEDICAL SOCIETIES

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF PSYCHIATRY.

AT a meeting of this section on Nov. 10th, Dr. BERNARD HART delivered his presidential address on

**Psychology and Psychiatry.**

It would seem, he said, to be a self-evident proposition that psychology and psychiatry should be intimately associated and mutually dependent, yet in text-books of psychiatry psychology was often abandoned altogether when an attempt was made to seek causal processes. There was a clear underlying implication that the psychological series constituted a surface froth beneath which lay solid realities only to be investigated by the weapons of other sciences. The word "psychology" was used in two senses: on the one hand it denoted concern with the "mental" or "subjective" group of phenomena; and on the other hand it meant an attempt to explain behaviour and mental processes by conceptions built out of the stuff of subjective experience. It was in the latter sense that some psychiatrists denied to psychology any useful place in the sphere of psychiatry. Every science advanced through three stages: the enumeration and collection of observed phenomena; the classification of these phenomena; and the endeavour to discover causal processes acting according to definite laws, which would explain the incidence of future phenomena. Almost all psychiatrists would accept psychology as far as the first two stages were concerned, but many absolutely refused to go further. It was clearly of fundamental importance to decide whether psychology was for the psychiatrist an *ignis fatuus* or a scientifically valid approach to his problems. Any attempt to push psychology beyond the descriptive stage had been beset with extraordinary difficulties, and for the most part the psychologist had only been allowed to record the phenomena of psychiatry and to attempt a crude grouping of them, any progress towards the third stage of causal conceptions being left to the physiologist and the chemist. This discarding of psychology had been conditioned, not only by its conspicuous failure to assist, but also by the materialism which had dominated the earlier history of science. The failure had been due, not to the intrinsic defects of psychology, but to ignorance of its possibilities and a faulty method of approach. Kraepelin's work, a study of longitudinal instead of transverse sections of mental disease, had given rise to the hope that his method would open up a great field of profitable research. This hope, however, had not been realised, although his conceptions of dementia præcox and manic-depressive insanity remained generalisations of great value. This was because the more fertile conception of reaction-types had replaced the older notion of disease-entities. Kraepelin had recorded phenomena in psychological terms; he had broken down the old symptomatological impasse and shown that the second stage of scientific method could be achieved without abandoning psychology. He had opened a road in psychiatry along which psychology had been able to make notable progress, but had not himself moved along that road.

#### ADVANCE OF PSYCHOLOGY TO THIRD STAGE OF SCIENTIFIC METHOD.

Important landmarks in this advance had been Charcot's remark that the phenomena of hysteria seemed to be the result of "ideas," and the exploration of this avenue by his pupils, Janet and Freud. It was difficult for the present generation to realise how extraordinarily refreshing Janet's work had been to those who had tramped through the arid wastes of academic psychology, seeking unavailingly for some help in the problems of life and medicine. His conception of dissociation cast a flood of light both on the psychoneuroses and psychoses. Hallucinations, delusions, and the bizarre utterances of dementia præcox could be regarded as manifestations of dissociated currents running contemporaneously in the field of consciousness, and some understanding could thereby be reached of what had hitherto been a chaos of mental processes.

The very essence of Freud's contribution to psychiatry was his systematic attempt to apply to its phenomena the concepts of meaning and purpose. He had introduced dynamic concepts while still remaining within the psychological field. He had advanced to the third stage of scientific method and constructed causal concepts out of psychological stuff—an epoch-making step which, if it could be established, raised psychology to a level with the other scientific disciplines which served psychiatry. He had finally produced a complex picture of entities acting and interacting according to fairly precisely defined laws, by which he believed it possible to explain, not only the phenomena of the psychoneuroses and psychoses, but also a considerable part of the general activities of the human organism. He had produced a body of theory and practice which, however faulty it might ultimately prove, and however it might be battered in the future slow growth of knowledge, would remain the first consistent attempt to apply to medicine a conceptual psychology built along the lines which had proved so fertile in other branches of science.

Out of his work had arisen that of Jung on dementia præcox, which had shown that, by the application of Freudian conceptions, the symptoms could be interpreted psychologically in an extraordinarily illuminating and refreshing manner. From that time onward the psycho-analytical attack upon the psychoses had been unremitting. Abraham had brought the libido theory definitely into relation with the psychoses, and his line of thought had led to Freud's conception of narcissism. The more recent work was necessarily intricate and unintelligible without a full knowledge of its background. Only two things needed note: first, that the psycho-analyst of to-day was prepared to give a psychological interpretation of the phenomena of the psychoses, those phenomena being shown as the result of forces working according to definite psychological laws; secondly, that in this interpretation he had found it necessary to employ an increasingly elaborated series of conceptual abstractions.

#### OTHER LINES OF ATTACK UPON THE PSYCHOSES.

Adler had brought the psychoses into line with the general psychological conceptions he had devised to explain the psychoneuroses. He maintained that psychosis appeared when the patient felt absolutely checkmated, with no hope of going on. Although his views were clearly unduly simplistic, they cast considerable light on some phenomena. Jung, approaching the subject from a very different standpoint, interpreted the psychoses in relation to his basic concepts, and he also achieved a measure of

success. All these interpretations differed profoundly from one another, but none of them was necessarily wrong.

The researches of Pavlov belonged to the sphere of physiology, and the behavouristic psychology which had been built upon them was not psychology in the sense in which the word was used in this address; it expressly declined to have anything to do with subjective experience. *Gestalt* psychology had up to the present mainly concerned itself with phenomena less complex than those that troubled the psychiatrist, but promised to be of great assistance in the future. Kretschmer's work had provided a most illuminating development of the reaction-type as opposed to the disease-entity system. The correlation with physical characters was the crux of the matter, and led straight into the physiological field. Many other investigators had attempted to link up the psychological and physiological methods of approach, but not much solid success had been achieved. Other approaches excluded even the most temporary use of psychology and built up explanatory causal conceptions exclusively on anatomical, histological, or chemical data. There was no possible objection to this procedure as a method of approach, but an attempt to write Hamlet without introducing the Prince of Denmark was unlikely to bring *complete* understanding.

### A PLEA FOR TOLERATION.

There was no answer to the preposterous question: "Which of these roads is the right one?" It was absurd to suppose that any science had the right to pre-empt a particular sphere of experience and to warn other investigators from trespassing thereon. The fallacy of "either—or" so far as the approaches to psychiatry were concerned, must be strenuously combated, and every method of approach must be given a free hand. It was reasonable to ask whether one method could be regarded as more promising than another, but it would be difficult to obtain an answer not conditioned by the traditions, habits of thought, and prejudices of the man who gave it. The attitude of tolerance could be applied not only to the major question of the respective claims of the physiological and psychological methods, but also to the divergences within the psychological method itself. Freud, Adler, and Jung each succeeded in illuminating some facets of the phenomena of psychiatry more satisfactorily than the others. It was reasonable to ask each school to push its conceptions as far as they would go, and only to discard them if phenomena were found which directly contradicted them. Although science allowed each of its members to play freely in its own ground, this permit was not perpetual; there must be a constant search for wider generalisations and an attempt to incorporate the findings of the newer sciences in the more universal formulæ of the older ones. There seemed to be good ground for hoping that we should in future be able to express the conceptions of psychology in terms of physiology; later in those of physics and chemistry; and perhaps ultimately in the universal formulæ of mathematics. It was, however, by no means inconceivable that at some point the road would be absolutely blocked. Certain conceptions—"purpose," for example—seemed altogether resistant to any attempt to incorporate them in the framework of mechanistic science, and the sequences of psychology and biology seemed to be essentially irreversible, and hence unlike those dealt with by physics and chemistry. This did not in the least mean that psychology could not remain a science, for the essence of science was simply the employment of a certain method, and not the adoption of mechanism.

In the recent past there had been a procession with the physicist and chemist in the van, the physiologist in the middle, and the psychologist in the rear, each member pushing to get as near the front as possible. Now the physicist of to-day was abandoning mechanism; he believed the stream of knowledge to be heading towards a non-mechanical reality, and the sphere in which the advance guard was moving seemed to have a colouring akin to the stuff of psychology. It seemed conceivable therefore that the procession would turn into a wheel and the psychologist, struggling perspiringly in the hope that he might ultimately attain to the van, might find that van already treading on his heels. It might nevertheless be argued that psychologists could only advance along the road which other scientists had travelled, but the obstinate refusal of psychological phenomena to fit comfortably into the framework of mechanism justified the belief that other avenues of approach were also worthy of effort. Even the method of science itself might prove an imperfect weapon for the psychologist. Jung had frankly adopted this position, which accounted for the perhaps unfairly expressed accusation of mysticism levelled at him. The method of science was not a unique, absolute, and unimpeachable key to knowledge; it was merely a particular system of attack which had proved so successful in enabling us to understand and control our experience that we were in danger of worshipping it as an absolute god.

No one approach could claim an exclusive divine mission to govern psychiatry. The formulations which would embrace all the facets in comprehensive generalisations lay very far ahead; at the moment neurologist, physiologist, chemist, and psychologist could only be asked for all the help they could give.

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## SECTION OF ANÆSTHETICS.

AT the opening meeting of this section on Nov. 6th, the President, Dr. G. RAMSEY PHILLIPS, being in the chair, a discussion on

### Anæsthesia for Diathermy and Endoscopy

was opened by Dr. H. W. FEATHERSTONE. Two important recent developments in surgical technique—namely, the use of high-frequency current for cutting or burning tissues, and the examination of cavities and viscera of the body by illumination with electric lamps—had, he said, brought certain risks when employed in operations on the lungs and air passages and in the neighbourhood of the mouth, for which inflammable anæsthetics were used. In many operations chloroform or a local anæsthetic alone was employed, but chloroform was not always advisable, and local anæsthesia might not be practicable. Although chloroform did not burn, even in an oxygen atmosphere, yet if heated strongly it disintegrated, and the product phosgene was highly poisonous, while other resultants irritated the respiratory mucous membrane. Under ether anæsthesia it might at any stage be necessary to employ diathermy, hence the need for the anæsthetist to be acquainted with the mechanism of explosions. Sometimes a mere pin-hole in a gas bag was the responsible defect; or a gauze mask impregnated with ether might be placed near a running electric motor. In a case in Canada, attended with fatal results, a patient was anæsthetised for a pharyngeal operation with ethylene and oxygen; diathermy becoming necessary, the ethylene was stopped and nitrous oxide and oxygen

was given for some minutes. After the diathermy application had been proceeding for a few moments an explosion took place, fatally injuring the patient. It was held to have been due to some of the earlier ethylene-oxygen having been swallowed and then regurgitated at the later stage. On the other hand, Dr. Lundy, of the Mayo Clinic, stated that in a series of 39,000 ethylene administrations there had not been an explosion. Sometimes the blowing of ether and oxygen into the pharynx by means of an intranasal or intraoral tube had resulted in explosions. Ether-oxygen mixture might ignite at a temperature of 190° C.

Realising the danger of explosion, it was a common practice for anæsthetists to use an apparatus which permitted administration of ether-air or ether-oxygen at the commencement of the operation, changing to chloroform-air or chloroform-oxygen a few minutes before an electric lamp or a diathermy apparatus was to be used. That was the procedure at a recent operation with fatal result in Birmingham. The autopsy in this case showed extensive bruising of the pharyngeal mucous membrane, with a ragged tear three-quarters of an inch long in the mucous membrane of the left pyriform fossa, the underlying tissues being infiltrated with pus. The bronchi were intensely congested. Evidently the first explosion occurred in the patient's mouth, and was transmitted along the rubber tube to the anæsthetic apparatus; defective contact between the lamp and the holder produced the sparking. It was important to remember that ethylene-oxygen should never be used in conjunction with any form of electrical appliance, with its wide range of explosibility, from 2 to 20 per cent. The ether-air mixture which was delivered into the trachea from an intratracheal ether apparatus, if sufficiently rich to maintain anæsthesia, could always be ignited, and this must be remembered when diathermy of the lung was to be performed.

A pertinent question was: Was the exhaled air and ether from the lungs of a deeply anæsthetised patient combustible? To test this Dr. Morgan and he had applied a spark or flame to (1) specimens of expired air and ether collected immediately after the withdrawal of a heavily impregnated ether mask; (2) the collected expirations during deep ether anæsthesia; (3) a mixture which was exhaled immediately after a deep inspiration of a strong ether-air mixture. It was impossible to ignite any of these specimens. Presumably this accounted for the rarity of cases of serious damage to patients in whose mouths a mild explosion or a burst of flame had occurred during the intrapharyngeal administration of ether and air. Hence it seemed that to apply diathermy in the mouth of a patient to whom ether had been administered was safe, provided: (1) the patient took a dozen breaths of fresh air following the discontinuance of the ether administration; and (2) care was taken to ensure that the stomach was not distended with ether vapour and air which might have been swallowed during induction. Nitrous oxide was not a combustible gas. He had found that the administration of a basal narcotic prior to the induction of anæsthesia enabled him to use gas-oxygen or very light chloroform anæsthesia, or, in some cases, to withhold the anæsthetic agent altogether during the diathermy or endoscopy. For cases liable to have bleeding into the lung or air passages an adult dose of grs. 3 to 4½ of nembutal by the mouth gave a short partial narcosis without depressing the respiratory centre, and there was an early return of the pharyngeal and laryngeal reflexes. Avertin and pernocton had been valuable in these cases.

### INVESTIGATION OF EXPLOSIVE CONDITIONS.

Mr. J. D. MORGAN, D.Sc. (Birmingham), who illustrated his statements by experiments, said that most gases were only capable of supporting combustion when mixed with air or oxygen in proportions which lay between certain limits. If a mixture of maximum inflammability were ignited in a glass tube, the flame moved rapidly through the whole tube; either a richer or a weaker mixture would burn less rapidly, but the flame would not be extinguished until it had passed through the whole tube. The lower limit for ether-air was about 2 per cent., but the upper limit did not seem capable of very precise measurement. The lower limit of ether-oxygen was slightly less than 2 per cent. With downward propagation of the flame the upper limit had been given by different authorities as 26 per cent. and 40 per cent.; with upward propagation of the flame the upper limit might be as high as 90 per cent. of ether vapour. In ether-oxygen, increase of the oxygen content increased the ignitibility of the mixture. An ether-air mixture of strength sufficient for anæsthesia would stand a large spark without exploding, but the same spark would readily ignite a mixture of the same proportions consisting of ether and oxygen. He emphasised the relatively low ignition temperature of ether-air and ether-oxygen mixtures. Ether vapour ignited at the relatively low temperature of about 190° C. Liquid ether, when contaminated by impurities, might ignite at a temperature as low as that of boiling water. It was very important for the anæsthetist to know that rich ether-oxygen mixture would ignite more readily than a corresponding ether-air mixture. When ether and oxygen were combined in a maximum inflammability mixture the greatest danger existed, and the slightest spark would cause ignition. He had found that the mixture of ether which could be obtained when air or oxygen was passed through the chloroform bottle of a Shipway apparatus was one approaching maximum inflammability, so in the Birmingham case the risk of explosion which existed while the patient was receiving chloroform was much greater than when ether was being administered. That was because the outlet of the ether bottle was always open to the delivery pipe, and ether vapour was free to pass to the delivery pipe by either diffusion or suction. This danger was increased when warm water was placed around the ether bottle; conversely, the danger might be absent when the ether was very cold.

Dr. Morgan had, he said, arrived at two conclusions: (1) that no electrical apparatus of any kind capable of giving a free spark or exposing a hot surface should be inserted into the mouth of a patient while ether-air, and especially ether-oxygen, was being administered; (2) that the Shipway apparatus, when employed in operations in which risks of ignition occurred, ought to be fitted with a cock which closed the outlet from the ether bottle when the air or oxygen was diverted to the chloroform bottle. He exhibited a specimen pencil light and a cock devised to obviate the kind of risks which preceded the Birmingham explosion. In the lamp a spring contact was arranged in the bulb socket, hence no sparking could occur between the bulb and the socket while in the mouth of the patient; and the lamp could be readily sterilised if necessary.

### DISCUSSION.

Mr. MUSGRAVE WOODMAN said that everything possible had been done at the Birmingham operating theatre to make for safety; there were fire-proof switches, and power was carried off by leads from outside the theatre; no sparking took place in the

theatre itself. Laryngologists should insist that, whatever the patient's condition, oxygen should never be used when a lamp was placed in the mouth. Personally he did not rely on switching on chloroform. He always inserted the lamp the moment the anæsthetist stopped, so as to secure the richest mixture in the mouth; he did not wait for inflammable dilution.

Dr. C. F. HADFIELD spoke of the part which might be played in these accidents by a chemically harmless gas of itself when it was supporting combustion, a fact noted by Priestley in 1776. He drew attention to the valuable work in these subjects done by the late Prof. H. B. Dixon, and said the attitude of the anæsthetist should be one of excessive caution. The danger of a serious result from explosion was greater if the vapour was being administered endotracheally. The use of the diathermy knife increased the range of danger, even if the spot at which it was employed was some distance from the actual anæsthetic. Ether had been found capable of getting through the towel surrounding the patient or round its folds.

Dr. KIRKBY THOMAS related an incident within his own observation which showed at what a low temperature ether vapour would explode. Possibly the mere heat of a lamp might suffice.

Dr. A. LOWNDES YATES spoke of the chance of the aspirating apparatus for the removal of mucus from the nose becoming sufficiently hot to cause explosion.

Mr. V. E. NEGUS said that if the suction pump was properly enclosed there should be no risk. Regarding the possible danger from the use of headlights by the laryngologist, the majority of endoscopic examinations could be carried out without a general anæsthetic, and with diathermy chloroform could be employed.

Dr. LANGTON HEWER said he had carried out intubation under ether anæsthesia, and he had never heard of a case of explosion in those conditions. He also referred to possible risks when giving anæsthetic mixtures in a private room a few feet from a fire.

The PRESIDENT reported a case of combustion occurring in a gas and oxygen apparatus said to be due to the sudden liberation of oxygen at high pressure (1750 lb. per square inch) into the closed space between the bottle valve and the reducing valve. The heat produced by the sudden compression of the air between the two valves is sufficient in the presence of oxygen to ignite the material of which the valve is composed. He had been told also by the manufacturers of oxygen that appreciable quantities of ether had occasionally been found in oxygen bottles returned for refilling. To reduce the risk in the first case the reducing valve should always be opened first and the bottle valve then turned on very gradually. To avoid the second the oxygen valve should be turned off immediately the bottle is empty.

Mr. W. G. HOWARTH spoke of the value of basal narcotics in cases where inhalation anæsthetics involved explosive dangers. With the help of the former he had carried out many such operations with no additional anæsthetic at all.

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## SECTION OF SURGERY.

AT a meeting of this section held on Nov. 4th, the chair being taken by the President, Mr. C. H. FAGGE, a discussion on the

### Treatment of Acute Osteomyelitis

was opened by Mr. GWYNNE WILLIAMS. The first difficulty in discussing this subject was, he said, the great variety of the disease combined with its infrequent occurrence. Acute osteomyelitis he would define as a sudden illness associated with fever and evidence of inflammation of the bone, the duration being in days rather than in weeks; he would limit his remarks to cases occurring in the long bones and due to the *Staphylococcus aureus*. It was improbable that the same treatment would be successful in both streptococcal and staphylococcal infections The great difference in the adult bone was slowing of the process, so that the cases were subacute rather than acute, and might be excluded from his definition. In assessing results he thought it best to consider first the immediate mortality; secondly, the saving of the limb; thirdly, the extent of suppurative necrosis; and fourthly, the usefulness of the limb in after-years. Of 91 cases under his care seven had been adult, and 18 deaths had occurred. In most of these cases the organism had been recorded as a staphylococcus. Ten deaths had occurred within one to four days of operation and probably could not have been prevented by operation; they had been septicæmias. One case had died without operation. The remaining seven had died about ten days after the bone had been laid bare to the extent to which pus had been visible. The fever had persisted and there had been pericarditis or other sign of widespread infection. Spread had not, therefore, been prevented by surgical intervention, which might, indeed, have put the patient at a disadvantage.

#### THE STARR AND ORR TECHNIQUES.

Recently surgeons had tended to drain by trephining holes, rather than by the wider gutter exposure. It was doubtful whether the new method of removing the whole bony focus would prove to be of general application, though it had produced striking results in certain cases, notably of infection of the fibula and femur, and particularly in affecting the illness of the patient. The practical choice lay between guttering the medulla and drilling. It was doubtful if the widest opening-up produced adequate drainage; the fever abated very gradually whatever method was used. Dramatic falls of temperature might be expected from adequate drainage, but were practically never seen. The extensive opening had failed to prevent a high mortality. Therefore, in the early days of a case, less severe measures should be undertaken. It was not always necessary or even desirable to open up the bone at all. Mr. Williams quoted a case in illustration of this point.

In the post-operative treatment every effort must be made to maintain the patient's general resistance; they should be treated in the open air and kept free from pain by efficient splinting. Orr's method of vaseline and plaster-of-Paris was a great advance; its disadvantages were the foul smell and the difficulty of inspecting the wound and the limb. This latter was not very serious, as the plaster could easily be removed if the general condition suggested that all was not well. The method gave the patient great peace. Blood transfusion had not, in Mr. Williams's experience, been a success in cases of infection.

The possibility of saving the limb depended largely on the extent of invasion of the neighbouring joint. The problem varied from joint to joint. The less done to the bone the smaller the sequestrum.

Mr. ERIC LLOYD quoted a series of cases from Great Ormond-street. He said that his statistics proved nothing, save that the mortality was often about 30 to 35 per cent. There was no hard-and-fast line between acute, subacute, and chronic, and it was very difficult to find a via media in selecting cases. His series had undergone different operative procedures by different surgeons. Of 40 cases, 27 had recovered.

and 13 had died. Of the 26 staphylococcal cases 10 had died and 16 had recovered. The pathology hitherto taught to students had been that of the dead rather than of the living—or dying—bone. The point at issue was whether invasion of the medullary cavity occurred early or late. Starr's slogan had been, "Drain the metaphysis; spare the diaphysis," but the metaphysis was, of course, really part of the diaphysis. The thinnest part of the bone was close to the epiphyseal cartilage and a perforation would usually be found, if sought, at the highest point of the abscess. Occasionally, simple incision of the periosteum led to dramatic benefit; these were cases where Nature's perforation was adequate. Starr had believed that medullary infection was not a direct spread but occurred by tracking up the Haversian canals from the subperiosteal abscess, and that the medulla could safely be left to look after itself.

Mr. Lloyd described two cases illustrating the good results of drilling into the metaphysis and putting the limb in plaster. Open-air treatment by Orr's method was of great advantage to the patient.

### GENERAL PRINCIPLES.

Mr. W. H. OGILVIE said that his figures had only revealed two well-known facts: that osteomyelitis was a rapidly disappearing disease and that the death-rate depended more on the length of the illness and the particular bone affected than on any line of treatment. Treatment must therefore depend on eternal principles; there was a disquieting tendency at the moment to follow fashion rather than principle. The speaker found himself becoming more and more insular in the matter of osteomyelitis—i.e., a supporter of the gutter method as recently improved. The spread of infection was arrested for a considerable time by the cancellous tissue, as shown by Starr's reasoning and the practical success of limited drainage. Nevertheless, it was doubtful whether a series of drill holes gave adequate drainage. An abscess could only heal by the falling together of its walls, and the Starr technique left a rigid walled cavity with a tendency to sequestrum formation, subsequent wide inflammatory processes, and recurrence.

The Orr method had not deserved the recognition it had received in this country; it had arisen out of special war conditions. It would remain the best method where there was a shortage of materials or of nurses. Many lives had been saved by it, but at the expense of much fibrous tissue. Scar tissue meant loss of function and liability to recurrence. Gutter operations need not sacrifice a large area of bone, involve painful dressings, or leave a scar attached to bone. The method might learn circumscription from Starr and immobilisation from Orr. It should leave healthy tissues in contact with the gutter, and remove one-third of the circumference of the bone in the area where pus was found in the cancellous tissue. The limb was slung, and drainage was supplied by Carrel tubes; two-hourly irrigation was carried out until the general condition showed that infection was dead. Dressings need only be changed once a week and the change was painless. Any subsequent operations through smooth, healthy skin were easy and likely to have good results.

Mr. MAX PAGE did not think it possible to work from principles in this matter; his impression was that trephining was the best method. He was convinced that extensive operations caused more sequestration and more trouble afterwards. Half the cases had a bacteriæmia and yet recovered. The surgeon could not save the fulminating case, however early he intervened. He agreed that blood transfusion had not proved helpful. The Orr method was detestable and quite impossible in a closed ward, but it must have something in it, and it reminded the surgeon that bathing in pus might not always be a bad thing.

### SEQUESTRA DUE TO OPERATION.

Mr. A. J. GARDHAM suggested that a very large amount of the sequestration seen was due not to the osteomyelitis but to the operative interference. He showed X rays to support this thesis, and declared that in 70 per cent. of cases sequestra were determined by the position and extent of the operation. Opening the bone did not help the prognosis in the acute stage and actually hindered smooth convalescence. There were certain cases in which sequestration would occur and nothing the surgeon did would affect it, but in the ordinary mild case sequestra were the direct result of treatment.

Mr. C. C. HOLMAN quoted a case illustrating the acute septicæmic type of the disease, and declared that immediate operation was unwise in these cases. Many lives had been lost by early operation in streptococcal osteomyelitis. Of 21 moderate cases in his experience, pus had only been confined to the bone at the time of admission to hospital in two. Where the pus was under the periosteum he often did not open the bone; there had only been one death. The subject was well worthy of a collective investigation. More radical methods, such as resection of the diaphysis, might give better results in the survivors but were not worth a higher death-rate. Operation should often be delayed to allow the patient to acquire general resistance, and interference should be the minimum possible. He advocated packing with bipp gauze, and Cotton's treatment by 1/15,000 saline solution of mercury perchloride for subacute infections of the knee-joint.

Mr. J. P. HOSFORD showed an X ray of a case in which the disease had invaded the epiphysis, and mentioned that in a few cases arteries were found actually transgressing the epiphyseal cartilage. He asked the best way of dealing with such a condition; to attack and destroy the cartilage, or to allow pus to enter the knee-joint and then drain it?

Mr. O. L. ADDISON said that the meeting had filled him with the deepest despondency. Were we really returning to the surgery of 60 or 70 years ago, the surgery that had filled our museums? He agreed with Mr. Ogilvie, and found himself unable to believe that a trephine hole gave adequate drainage. He had never had a sequestrum after a gutter operation; sequestra followed inadequate guttering. The best treatment for severe involvement of the femoral shaft was amputation.

Mr. KENNETH HERITAGE said that apart from the fulminant septicæmic cases for which little could be done, the whole crux of treatment lay in early diagnosis. Thus any child showing localised exquisite tenderness over a long bone, combined with fever and other evidence of sepsis, should have that bone explored. Diagnosis should not be delayed until either a subperiosteal abscess or gross œdema of the soft parts called for interference, as a negative exploration could do no harm. It was in such cases, diagnosed early, whilst the infection was still limited to the metaphysis that the methods of Starr and Orr found their chief field of application. The simpler and less shock-producing technique of Starr had given better results than wide guttering. Under a tourniquet the periosteum was exposed and incised at the point of maximum tenderness. If no pus was found under the periosteum the metaphysis was

drilled at intervals starting near the epiphyseal line. A trephine disk was then removed having for its centre the drill hole from which pus was seen to exude. The cavity was then packed with vaseline gauze, the skin incision brought loosely together, and the limb immobilised. Plaster was useful in affording freedom from movement and interference. The three most important principles of treatment were early diagnosis, metaphyseal drainage without opening the medullary cavity, and absolute immobilisation.

Mr. GWYNNE WILLIAMS briefly replied.

## LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this Institution on Oct. 29th, with Prof. W. BLAIR BELL, the President, in the chair, was devoted to a symposium on

### Intracranial Tumours.

Dr. T. B. DAVIE divided these growths into the following groups: (*a*) gliomas, 41·2 per cent.; (*b*) meningiomas, 12·5 per cent.; (*c*) auditory nerve tumours, 9·4 per cent.; (*d*) pituitary and hypophyseal stalk tumours, 21·7 per cent.; (*e*) secondary carcinomas, 4·7 per cent.; (*f*) granulomas, 2·7 per cent.; (*g*) blood-vessel tumours, 1·7 per cent.; and (*h*) miscellaneous tumours. He showed several examples of acoustic nerve tumours, and demonstrated their essentially fibromatous structure, constrasting it with the endotheliomatous structure of the meningiomas. In discussing the gliomas he adopted the classification of Bailey and Cushing, with some of the modifications suggested by Carmichael and by Penfield. In conclusion, he pleaded for further and more general study of these interesting tumours.

Dr. HENRY COHEN pointed out that the signs and symptoms of intracranial tumour arose from the presence of a foreign body, gradually increasing in size, in a relatively non-expansile chamber and from the site and nature of the foreign body; hence the complete diagnosis must comprise an answer to all three questions: whether, where, what? The general signs resulted from a gradually increasing intracranial pressure, and this depended on and varied with the size and rate of growth of the tumour and on interference with the circulation of blood and cerebro-spinal fluid, especially the latter. The localising signs of a tumour were produced by increase, perversion, decrease, or abolition of cerebral function; resulting from (1) destruction of nerve elements; (2) pressure on, with displacement of, nerve elements and resulting loss of function; or (3) interference with the circulation of blood and cerebro-spinal fluid, especially the former. Dr. Cohen laid special stress on generalised epileptiform convulsions as an early expression of increased intracranial pressure. Papill-œdema, he said, was relatively uncommon in early supratentorial lesions. In diagnosis inspection, palpation, percussion, and auscultation of the cranium were required. The chief accessory means of diagnosis were examination of the cerebro-spinal fluid and radiography; other methods—such as brain puncture (Pfeiffer) and the electrical resistance method of Bohnenkamp and Schmäh, were of interest but not of routine clinical value. Manometry, combined ventricular and lumbar puncture, and especially the examination of cerebro-spinal fluid were important, though the danger of lumbar puncture, especially in subtentorial neoplasms, was very real. Radiography was of help, both directly and indirectly, after the injection of contrast media. In attempting pre-operative diagnosis of the nature of the tumour, the points needing most careful consideration were the age of the patient, the site of the tumour, the mode of evolution of symptoms, evidence of disease elsewhere, and such accessory tests as serological, cutaneous, blood and cerebro-spinal fluid examinations, auscultation, and radiography.

Prof. R. E. KELLY said that trephining was probably one of the oldest surgical operations, going as far back as neolithic times. Hippocrates, Galen, and Celsus used the trephine and gave practical hints for its use. In a work by Scultetus in 1650 there were numerous illustrations of head operations performed by instruments similar to those in use at the present time. Broca might be looked upon as the founder of cranial surgery, for he was the first to trephine for abscess. Prof. Kelly demonstrated the more modern instruments of Hudson, de Martell, and Souttar, and showed a cinematograph film and four patients, three of whom had had meningiomas removed.

## ULSTER MEDICAL SOCIETY.

AT the opening meeting of the session, held in Belfast on Oct. 15th, Mr. S. T. IRWIN gave a presidential address on

### Enlargement of the Mesenteric Lymph Glands.

He confined his attention to such enlargement as may be found at operation where there is no obvious naked-eye disease of the abdominal contents, thus excluding such conditions as Hodgkin's disease, carcinoma, lymphadenitis secondary to ulceration of the gut, and tuberculous lymphadenitis of the type which produces a palpable swelling or leads to obvious acute or chronic intestinal obstruction.

The recognition of enlarged lymph glands as a definite clinical entity, said Mr. Irwin, we owe to Edred Corner, who wrote on this subject in 1905, but as late as 1918, when H. W. Carson published his now classical description, many people remained doubtful. At first all the enlargements were regarded as tuberculous, but in 1922 Heusser, after detailed examination of 40 specimens obtained at operation, concluded that many were non-tuberculous.

In normal health the mesenteric glands may be as large as a hazel-nut or almond, but anything much larger than this must be considered pathological. Normally the largest glands are the most proximal and a reversal of this order is in itself evidence of some pathological lesion. In the ileocæcal area this reversal is the rule in acute lymphadenitis, and is also found in many cases of ileocæcal intussusception where the glands may be so large as to resemble a bunch of purple grapes, the proximal glands in these cases approaching normal size. In the superior mesenteric area, on the contrary, the largest glands are usually found at the root of the mesentery, though on occasion even here reversal of the normal may be found. As regards naked-eye appearance and consistence three types may be mentioned. (*a*) The glands may be enlarged, red, soft, fleshy on section, and flattened. Such glands tend to be matted together. They are found in acute lymphadenitis, especially when this occurs in the ileocæcal area. (*b*) They may be firm, hard, fibrous on section, and discrete, suggestive of a chronic inflammation. These are found at operation mainly in the mesenteric area and in the small omentum around the cœliac axis. (*c*) They may show definite evidence of tubercle, such as caseation, calcification, and even chronic abscess formation.

Other changes found in the abdomen in cases showing gross glandular enlargement may be abnormal irritability of the gut, spasm of the pylorus, temporary œdema of the gut, and irritability of the abdominal wall. That many of the cases are due to tuberculous infection there is much evidence to show.

CLINICAL ASPECTS.

The symptomatology of these cases is often diffuse and the operative findings manifold, but the cases may be classified under three heads.

1. Acute lymphadenitis of the ileocæcal group seen during the acute stage. These are of tuberculous origin of the bovine type. Infection occurs in early life by the swallowing of bacilli either in milk or infected foods. Sometimes the symptoms suggest that the disease is a primary infection, and this type closely resembles acute appendicitis. There is, indeed, no single symptom of appendicitis which may not be simulated by acute lymphadenitis, but it is worth while to make the distinction, for operation has a definite mortality and, as a result of operation, the disease may be spread to neighbouring organs. Diagnosis can often be made reasonably certain by careful consideration of previous history, the nature of the onset of symptoms and their progress, the type and situation of the initial pain, the temperature at the onset, the condition of superficial lymph glands, and careful abdominal examination. In these cases operation is unnecessary and therefore undesirable.

2. Chronic lymphadenitis following an acute attack seen weeks, months, or years after such attack. In many cases there is no definite history of the primary attack. The cause is again tubercle. The symptoms and signs will depend to some extent on the interval of time from the acute attack. The glands may be uniformly enlarged, soft and fleshy, but usually caseation or calcification will be found in some of the glands. The ileocæcal group alone may be affected or the enlargement may affect the mesenteric and cœliac groups as well. Here again diagnosis is difficult. Symptoms may be wholly referable to the upper abdomen—acidity, nausea, pain of the duodenal type, loss of appetite, and constipation. Patients are easily exhausted by overwork or confinement. They are frequently tender in the right iliac fossa at a point above and medial to McBurney's point. Test-meal and radiological examinations are often misleading—the former may indicate delay in emptying with normal or hyperacid curve, and the latter not seldom shows marked delay in the stomach with hypermotility of the head of the meal. Operation may be necessary to clear up the diagnosis. It will, however, indicate the lines of subsequent treatment, especially freedom from fatigue and confinement and a plentiful and nutritious diet.

3. The third group is still less clearly defined. The glands most often affected are those in the mesenteric and cœliac areas. They are hard, fibrotic, and discrete. They preserve normal relationship of size to position. On section they show no definite evidence of tubercle and yet they closely resemble the enlargement which is found when an obvious infection by tubercle has occurred at the ileocæcal angle. The alternative views that they are due to simple infections from a chronic appendix, abscesses in connexion with teeth and tonsils, influenza, rheumatism, &c., are merely matters of surmise. It is also held that as sections of the glands show merely a simple hyperplasia they point to a hypertrophy due to some excessive demand for increased functional activity such as might be due to the unnatural diet of modern man. The symptoms are vague in the extreme. The patients have their appendices removed by one surgeon, their gall-bladders by another. They may have had a gastro-enterostomy done in one hospital, to be undone later in another because to their former symptoms was added the vomiting of bile. They are edentulous and have had their tonsils successfully enucleated.

These patients form an appreciable proportion of chronic abdominal problems occurring in practice. Out of 375 chronic abdominal cases submitted to operation there were: appendicitis, 82; duodenal ulcer, 240; enlarged mesenteric glands, 53.

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CARCINOMA OF THE BREAST.—The third sentence of Mr. Philip Hawe's remarks reported on p. 1026 of our last issue should read: "Of 38 early cases, *excluding* nine cases not traced, 29 were alive five to ten years after operation; of 74 late cases, *excluding* ten cases not traced, 24 patients were alive five to ten years after operation."

# REPORTS AND ANALYSES

## ARKINA NATURAL MINERAL WATER

FROM YVERDON-LES-BAINS, SWITZERLAND.

(ARKINA EXPORT CO., 72, DUNSTER HOUSE, MARK-LANE, E.C.3.)

THE water is tasteless, colourless, odourless. It is slightly alkaline, and its use is advised in cases of arthritis, gout, rheumatism, and similar conditions. Analysis showed the following composition in grammes per litre:—

| | | | |
|---|---|---|---|
| Chlorine (Cl) | 0·010 | Magnesia (MgO) | 0·058 |
| Sulphuric acid ($SO_3$) | 0·274 | Iron and alumina | 0·008 |
| Soda ($Na_2O$) | 0·013 | Silica ($SiO_2$) | Nil. |
| Potash ($K_2O$) | 0·035 | Total solids after ignition | 0·855 |
| Lime (CaO) | 0·309 | | |

These results may be expressed in combination as follows (again in grammes per litre):—

| | | | |
|---|---|---|---|
| Sodium chloride | 0·009 | Calcium bicarbonate | 0·337 |
| Sodium bicarbonate | 0·022 | Magnesium bicarbonate | 0·210 |
| Potassium chloride | 0·010 | Calcium sulphate | 0·467 |
| Potassium bicarbonate | 0·061 | Iron and alumina | 0·008 |

The main constitutents of this water are sulphate of lime and bicarbonates of lime and magnesia. Its slight alkalinity (pH 8 to 8·5) may be regarded as a favourable indication. No organic matter was found. The claim is made that this water is radio-active.

## FRESH VITACREAM.

(VITACREAM, LTD., 48, MARK-LANE, LONDON, E.C.3.)

This preparation closely resembles ordinary cream in appearance, texture, and flavour. It claims to be made from Grade "A" milk and pea-nut oil. The carton contains a little over 1¼ lb. and is sold at 1*s.* 6*d.* When analysed the following results were obtained:

| | | |
|---|---|---|
| Total solids | 49·8 | per cent. |
| Water | 50·2 | ,, ,, |
| The solids consist of:— | | |
| (1) Total fat | 43·46 | ,, ,, |
| (2) Protein (N × 6·39) | 2·54 | ,, ,, |
| (3) Mineral constituents | 0·40 | ,, ,, |
| (4) Lactose | 2·80 | ,, ,, |

When tested for preservatives, boric acid and formalin were found to be absent.

The preparation is an interesting one owing to its close resemblance to ordinary cream. Pea-nut oil is a perfectly wholesome fat, and enters into the composition of many foodstuffs. The cheapness of this synthetic cream should render it attractive.

# REVIEWS AND NOTICES OF BOOKS

## Rheumatic Infection in Childhood.

By LEONARD FINDLAY, M.D., D.Sc., M.R.C.P., Physician, East London Hospital for Children; late Professor of Pædiatrics, Glasgow University. London: Edward Arnold and Co. 1931. Pp. 187. 10*s.* 6*d.*

IN this book Dr. Leonard Findlay presents the results of the exhaustive investigation into rheumatism carried out in Glasgow during the last decade, and discusses the deductions which may be drawn from them. His views on a subject on which he is an experienced authority cannot fail to carry great weight, and are effectively expressed in a lucid and logical style. Objective manifestations alone have been considered. The rheumatic infection has been taken as including arthritis, chorea, carditis, and nodules; little or no reference is made to subjective symptoms such as "growing pains." The author brings statistical evidence to bear on many traditional views; he has little respect for some medical myths, both ancient and modern, such as that of the child who was frightened into chorea, or the elusive conception of a "pre-rheumatic state." He has no belief in the existence of a dietetic factor in the ætiology of rheumatism. The principal rheumatic manifestations are discussed in successive chapters, and statistics bearing on their incidence, the combinations in which they occur, and the ultimate result of treatment are presented in numerous tables. Dr. Findlay is fully aware of the difficulties which may arise in interpreting these figures, and in reconciling statistics obtained from post-mortems with the results of clinical observation, as in the question of the incidence of aortic disease (p. 74). He is unable to testify to the existence of the miliary nodule of Coates and Thomas. The line of treatment recommended is, in the author's own words, heroic. All cases, including those of chorea, are kept in bed for at least three months, with continuous salicylate medication, as a prophylactic against carditis. Salicylate is given in doses of grs. 120 or more in the day. The importance of combining this drug with alkali, which has been recently called in question by some authors, is strongly upheld.

This is a work of considerable importance, which will claim for itself a prominent place in the literature of the subject. It should be read by all who are interested in pædiatrics, or are engaged in public health work in schools and clinics.

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## Infection in the Rheumatic State.

*The Factor of Infection in the Rheumatic State, the so-called Rheumatic Fever.* By ALVIN F. COBURN, M.D., Resident Physician of the Presbyterian Hospital in the City of New York. London: Baillière, Tindall and Cox. 1931. Pp. 288. 27*s.*

AT first glance this book does not attract. It is plentifully sprinkled with photographs and charts and even with coloured prints, but these do not carry conviction. Further study reveals that carefully controlled investigations are recorded on certain aspects of rheumatism. Large numbers of cases have been used for the investigations and more important still the reactions of non-rheumatic controls have been compared side by side with those of rheumatic subjects. The chief points studied have been (*a*) the part played by climate in the ætiology of rheumatism, (*b*) the importance of upper respiratory tract diseases as a source of infection and particularly the importance of the hæmolytic streptococcus. Other facts have emerged during the investigations as, for instance, the definite relationship between scarlet fever and rheumatic heart disease, and the undoubted existence of an individual idiosyncrasy or inherent susceptibility on the part of the host with variations of tissue response with age, and with fluctuations of state within the individual. The reactions of human skin to injections of bacterial nucleoproteins are discussed, and the possibility of an association between active rheumatic disease and recent upper respiratory infection with *Streptococcus hæmolyticus*. Many illustrative cases are given, and it seems clear from reading the histories that the manifestations of acute rheumatism as seen in the Presbyterian Hospital in New York are much more violent and protean than those seen here in London of recent years. Rheumatic fever as described in the text-books is comparatively rarely seen in these days, when the more insidious forms of rheumatism, the so-called subacute rheumatism, is much more common. The frequency of epistaxis as a symptom is emphasised and many forms of skin rashes are described; in England these manifestations are relatively uncommon. It is possibly this striking difference in the clinical picture of the disease which accounts for the fact that some of the coloured prints are not convincing to British readers, but to scientific workers anywhere the frontispiece would surely seem inappropriate.

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## The Nervous System.

*An Elementary Handbook of the Anatomy and Physiology of the Nervous System.* New edition. By JAMES DUNLOP LICKLEY, M.D. With 117 illustrations. London: Longmans Green and Co., Ltd. 1931. Pp. 144. 10*s.* 6*d.*

WE reviewed the first edition of this book as long ago as 1912; the new edition differs in a number of material respects from the original. It gives a representation on elementary lines of the chief morphological features of the neuraxis, macro- and microscopical, together with an account of the anatomy and physiology of the sense-organs. Many of the diagrams and figures show improvement on those formerly utilised, but some still need revision. It is regrettable that those of the cerebral cortex (p. 71) have not been replaced, for neither of them corresponds to the author's textual description of five cortical layers; alternatively, the latter should be modified. In Figs. 76 and 77 the allocation of "psychic" functions to portions of the cortex indicated by dots on the diagrams can scarcely fail to suggest to the student the misleading idea that there are anatomical "centres" for these functions; besides, what is sensation if not a psychic function? Yet it is here supposedly represented apart from "psychic portions" of the area. Dr. Lickley follows the teaching of Sir Henry Head as regards protopathic and epicritic sensory systems, although he mentions other possibilities in his text. In some respects, indeed, the author's textual descriptions are more accurate, in the sense of indicating other views and theories, than might be anticipated by references to the diagrams alone. The book, taken as a whole, fulfills its purpose adequately.

## Experimental Cytology.

By J. GRAY, M.A., F.R.S. London: Cambridge University Press. 1931. Pp. 516. 25*s*.

Mr. Gray belongs to the new school of experimental zoologists who are as much physiologists as morphologists. He gives us here the substance of a course of lectures which he has been delivering for some years in Cambridge. We are grateful that he has thus enlarged his audience, for this is one of the most interesting biological books which has appeared in England for some time. It deals with the application of physico-chemical methods of investigation and interpretation to the study of living cells, and however abhorrent Mr. Gray's outlook may be to any individual reader, no one can fail to appreciate the coherence and clarity of his exposition. And after all, as he reminds us in the preface, experimental facts are facts and stand by themselves whatever scheme we weave them into. He discusses the structure of protoplasm, the architecture of cells, their shapes, surfaces, divisions, movements, and permeabilities. Medical scientists will reach more familiar ground when they come to the final chapter on phagocytosis. The mechanistic explanation is nowhere pressed to unreasonable lengths, and its imperfections and failures are pointed out as plainly as its successes.

## Cæsarean Section.

By FRANCIS IVENS-KNOWLES, C.B.E., M.B., M.S. Lond., Consulting Surgeon, Liverpool Maternity Hospital. London: J. and A. Churchill. 1931. Pp. 82. 5*s*.

THIS small book is based on a series of 352 consecutive cases under the care of the author. The series is of particular interest because it contains about 100 cases operated upon late in labour. The maternal mortality of these late cases is little more than the mortality of the whole series, which is 1·99 per cent. This result is striking and, since the author does not favour the lower segment operation, provides an important piece of evidence against this more difficult and more dangerous technique. The main difference between the treatment of a patient who is potentially infected and one who is not is that with the former a drainage-tube is inserted for at least 48 hours and antistreptococcal serum is administered at the time of operation. The tube is said to be inserted into the cave of Retzius but, from the context, it would seem more likely the author inserts it into the utero-vesical pouch. Mrs. Ivens-Knowles apparently favours drastic purgation both before and after operation. This is not in accordance with the practice of most surgeons, who have more faith in enemata, pituitary extract, and eserine.

In addition to the careful analysis of her own cases, the author gives a short but clear account of the views of others on the technique of Cæsarean section, with particular regard to the lower segment operation.

## Handbook of Skin Diseases.

Third edition. By FREDERICK GARDINER, M.D., Lecturer on Skin Diseases, University of Edinburgh; Physician for Diseases of the Skin, Edinburgh Royal Infirmary. Edinburgh: E. and S. Livingstone. 1931. Pp. 283. 10*s*. 6*d*.

THIS small text-book is ideal in many respects. Designed for the practitioner, it is practical, readable, and cheap. Most of the plates, if we except that of dermatitis herpetiformis, which is like nothing met with in nature, are true replicas of characteristic cases, and the half-tone illustrations are well up to the average. It is curious that pruritus ani et vulvæ should have found a place under the page heading of diseases due to light, while it surely cannot have been the author's intention to group alopecia areata under the fungus infections? The index finds no place for eczema, and while most dermatologists are agreed that this is not a good term, most English and continental text-books published in the last two years retain it, so that the average reader may find the omission embarrassing. It is astonishing also that there is no reference to lichen urticatus (strophulus)—surely one of the commonest of all eruptions in children? But apart from these points little fault can be found with the book. The chapter on remedial agents is excellent, and contains in a summarised form all that modern dermato-therapeutics can offer. It is clear that the author is a most experienced authority on treatment. On the treatment of impetigo contagiosa, he says, "if the physician will only bear in mind that he is dealing with a weak organism and a sensitive skin. . . ." The beginner will memorise that opening sentence, saving himself much future trouble, and his patients unnecessary discomfort and expense.

## Thomson and Miles' Surgery.

Eighth edition. By ALEXANDER MILES, M.D., LL.D., F.R.C.S., Consulting Surgeon, Royal Infirmary, Edinburgh; and D. P. D. WILKIE, M.D., F.R.C.S., Professor of Surgery, University of Edinburgh. Vol. I. London: Humphrey Milford, Oxford University Press. 1931. Pp. 574. 12*s*. 6*d*.

THIS manual of surgery has deservedly held a high place amongst student's text-books for many years. It has always been easy to read, convenient in size, sound in its teaching, and has admirably preserved the balance between inclusion and rejection, giving what is desirable in a book of this nature.

The new edition had been completely revised, Prof. Wilkie succeeding Prof. Thomson as co-editor. It is thoroughly modern in outlook and very little increased in size. The help of no less than 21 writers has been invited, and each has undertaken the revision of the section in which he is particularly interested. Whilst this ensures the teaching being up to date, the multiple authorship may ultimately lead to overlapping, unevenness, and perhaps to the loss of that individual character which was such a pronounced feature of former editions. We find no fault with the particular contributions to this edition on the score of duplication of material. It fulfils its purpose admirably, and however provides an excellent text-book for undergraduates, with whom it is likely to be as popular as its predecessors. But as the popularity of the work continues, editorship is bound to grow harder. The pictures in this issue are numerous and always informative.

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DONATIONS AND BEQUESTS.—The late Mrs. Emily Fawcett, of Bramhope, Yorks, among other large bequests, left £2500 to the Leeds General Infirmary, and £500 each to the Leeds Incorporated Institution for the Blind, Deaf and Dumb, the Leeds Maternity Hospital, and the Leeds Women and Children's Hospital.—Sir Percy Shepherd and his co-trustees have given £2000 towards the rebuilding fund of the London Temperance Hospital. Sir Percy Shepherd is the president of the hospital.

THE LANCET.

*LONDON: SATURDAY, NOVEMBER 14, 1931.*

## PROTECTION FROM X AND GAMMA RAYS.

THE death in Vienna early last week of Prof. GUIDO HOLZKNECHT as a result of X ray burns is, we may hope, one of the last tragedies of the unprotected worker. For HOLZKNECHT, to whom medicine owes more than to anyone else the exploitation of RONTGEN'S discovery, began his work more than 45 years ago, when the cumulative effects of prolonged exposure to X rays was not even thought of. Gradually he lost all his fingers and one of his arms, his death being due to secondary cancerous deposits. The present-day worker should be immune from harm if he follows conscientiously the precautions laid down at Stockholm three years ago, and now revised by the International X Ray and Radium Protection Commission, which met in July at Paris on the occasion of the third International Congress of Radiology. This Commission includes representatives from Great Britain, France, Germany, Italy, Sweden, and the United States, the British representatives, Mr. G. W. C. KAYE, D.Sc., and Dr. STANLEY MELVILLE, also being the hon. secretaries. It may be recalled with some little pride that the international recommendations were originally based on the proposals of the British Protection Committee, this country being the first, some ten years ago, to frame recommendations designed to promote the greater safety and well-being of the X ray and radium worker. In his Mackenzie Davidson memorial lecture, delivered in February, 1922, Dr. KAYE noted the persistency of hospitals in regarding the radiologist as akin to the mole or earthworm, and consigning his department to an ill-ventilated basement. On its round of investigation the British Committee had then found departments in which, with protective appliances in full swing, there was enough scattered radiation to show the bones of the hand on a screen carried round the room. Under the leadership of Sir HUMPHRY ROLLESTON, and with the coöperation of the Teddington Laboratory, the British committee worked out standards of protection against X and gamma rays, in terms of millimetres of lead and barium bricks, inspecting a hundred or more workrooms to see how their advice was received. Dr. KAYE was even then hopeful that the bogy of X ray dangers would soon be removed, and his hope has been justified. The influence of the international recommendations has been profound and world-wide, and now practically every civilised nation has taken steps to form a protection committee and to issue its own recommendations.

The experience of the last three years has led to only relatively minor changes in the international recommendations, and these are mainly accounted for by the growth in power of X ray equipment. As a whole the recommendations are largely unaltered, which is a tribute to their utility and practical character. In the first section, dealing with working hours, there is a new paragraph suggesting the desirability of a twice-yearly medical and blood examination of operators, particularly those working with radium. The gradual tendency to increase, in X ray therapy, the kilovoltage on the tube is met by a new table giving lead protective values for X ray tubes from 75 kilovolts to as high as 400 kilovolts, the values ranging from 1 to 15 mm. thickness of lead. In diagnostic work the importance is stressed of reducing palpation with the hand to a minimum. The difficulty experienced by manufacturers in securing the necessary flexibility in protective lead-rubber gloves which offer a reasonable measure of protection is met by a small reduction in the lead equivalent recommended of from $\frac{1}{2}$ to $\frac{1}{3}$ mm. lead. The necessity for effective earth shielding as a precaution against electric shocks with present-day high-powered and condenser-smoothed X ray equipment is emphasised. A further warning relates to the special electrical precautions which should be taken in rooms where anæsthetics are used in conjunction with X rays. The use of non-inflammable X ray films is encouraged, and where inflammable film is employed precautions should be adopted which extended experience has suggested—for example, the isolation of large stocks of film. As regards radium the bulk of the earlier recommendations stand, the chief change being a reduction in the amount of lead protection suggested for the storage of large quantities (several grammes) of radium, the previous figure recommended proving to be impracticably large.

The recommendations of the International Commission are obviously of value only in so far as they can conveniently be carried out, and their authority as a whole would be impaired if they contain any which are habitually and generally disregarded. In the opinion of Dr. FFRANGCON ROBERTS the requirements are excessive, particularly in regard to ventilation and the lining of walls, and he is to set out this view next week at a meeting of the British Institute of Radiology. It may be noted that the International Commission will next assemble in 1934 at Zurich, under the ægis of the fourth International Congress of Radiology, when the recommendations will be again reviewed in the light of experience, and such suggestions as may have been received in the interim. We understand that copies of the revised recommendations may be had free on request to the Director of the National Physical Laboratory, Teddington, Middlesex.

## THE SCHOOL MEDICAL OFFICER'S WORK.

TIME was when the study of idiosyncrasies and disease processes was the preserve of consultants and pathologists. It was Sir JAMES MACKENZIE who discovered how much valuable research was open to the general practitioner with his unique opportunities for clear and continued observation and his knowledge of the family history and daily life of the patients under his care. This is true in equal or greater degree of the school medical service, whose officers have the advantage of seeing large numbers of children so that no difficulty can arise in finding control groups of normal subjects. It may come as a surprise to those who have not studied the annual reports of the Chief Medical Officer of the Board of Education to learn how many qualified men and women are now associated with school medical work in some form or other. Although the number of senior officers whose work is confined to schools may be small—only one county and 11 county boroughs maintain a whole-time school medical officer—yet there are 305 school medical officers who give part time to other branches of medical work, 984 assistant school medical officers, 1722 additional practitioners employed on specialist duties, bringing the total strength of medical and dental staff up to the figure of 3023. There are in addition 5485 nurses working whole or part time for the school-children. Ten years ago, Sir GEORGE NEWMAN says in his latest report,[1] the school doctor had two complaints: first, that the routine inspection of endless children was monotonous and even soul-destroying; and second, that it was a blind-alley employment. The man who now makes these complaints knows often enough, he adds, that if valid these disabilities are his own fault. The monotony disappears when the wider scope appears, and the hope of a future lies in the expansion of the opportunity, the increased ramifications, and association with a more and more unified public health service.

A faithful picture of the work done in the school medical service may be gained from a careful study of the reports of which regular summaries have appeared for many years in our own columns. In one such report a county officer pointed out that, while the best work for school-children was being done by medical officers of experience, after a term of years some of the most efficient of these officers became weary of routine work and left the service for other branches of medicine, notably general practice. Their interest would undoubtedly be retained if there were a widening range of opportunities and interests, and, above all, encouragement to undertake original inquiries and research. The present report contains on pages 96 to 98 a list of special inquiries and reports made during the year 1930, few of which unfortunately see the light of day. Doubtless some proportion of this work is threshing over old stuff, but some of it reveals new and suggestive grain which should be winnowed for the benefit of the service as a whole. Work of this kind is of value in a variety of ways. It tends to keep up the standard of local school health; it has its application to school medicine as a whole; more than that, it throws light on the normal development of the young of the human race, knowledge of which is a necessary condition for any other branch of medical work. In the schools can be studied the manifestations which are on the borderline between physiological variation and pathology; a line whose determination is of no mere theoretical interest, for many children are condemned to unnecessary invalidism because in the absence of these data the family doctor is obliged to inculcate a blind policy of safety first. In the schools the medical officer sees the earliest manifestations of disease such as those of mild subacute rheumatism; he can study deviations from the normal, differentiating them into those due to type, idiosyncrasy, and actual disease. There is some falling off in the present year in the variety of the inquiries, which may be explained by the extra work thrown upon the health service by the transfer of the functions of the poor-law—good in the long run for the additional scope—and by the obligation under the new Act to survey the housing needs of the areas. But there should be no relaxation in the work of the service until the entrants to school become, as with few exceptions they might well be, normal healthy children and remain so throughout school life; for the service has long ago outlived the original reason for its introduction—namely, to fit the children to receive benefit from the education provided out of public money—and has set itself to ensure that our educational system shall build the whole body of children strong and healthy.

[1] Health of the School Child. Annual Report of the Chief Medical Officer of the Board of Education for the Year 1930. H.M. Stat. Office. Pp. 125. 2s.

## MILK IN CARTONS.

AT first sight it does not seem to matter whether milk is distributed in cardboard containers or in glass; the main point is that it should be clean and plentiful. Yet in fact the paper carton has much to recommend it besides its amusing novelty. First and most obvious is the sound principle that any food receptacle should be used once and then thrown away. True, we do not apply this maxim to our pots and pans and plates, but neither do we put these household gods outside the front door each morning to take the chances of the streets. Though science may collect the bottles daily and sterilise them to its satisfaction the voice of sentiment is still unquiet; and sentiment very often directs us towards the ideal of hygiene. So much for that; if milk comes to the door in a carton it comes in a clean container daily and the old one is never used again except to light the kitchen fire. But the real advantage of the paper wrapping lies in ease of transport. Bottles are so heavy and brittle that it proves expensive to send them over long distances; hence they are usually distributed over comparatively small areas, and the milk is not put in its containers until it reaches

these areas. The milk of London, for instance, is not, in practice, pasteurised and sealed in distant counties where it is produced, but comes in cans to the metropolitan centres whence it is distributed. Since double pasteurisation is not permissible, it makes this journey in the raw state, and in hot weather its bacterial count must rise considerably before it arrives. The alternative plan was demonstrated to London medical officers of health last week when they visited the new Bladen Dairies near Dorchester (see p. 1108). Here the milk is collected from surrounding farms, immediately pasteurised, cooled, and packed in cartons. These cartons fit neatly into boxes made of corrugated double cardboard to keep them cool and are on sale in London 24 hours after the cow was milked.

The relative advantages of pasteurisation just after milking and pasteurisation just before delivery are disputable, and the former method clearly demands high technical efficiency if the milk is to be equally free from active organisms when it reaches the consumer. With either, however, it is essential to maintain a high standard of cleanliness in the farms, and here there seems to be some advantage in placing new organisations in the country rather than the town. The Bladen Dairies at present gather milk from about 90 farms within a radius of 20 miles. These farms compete with one another to receive the higher payment per gallon which is made to those whose milk does best in the monthly tests of cleanliness. Lists of the successful are published in the local newspaper, and in course of time, while the sphere of operations will doubtless enlarge, the individual farmer's pride is likely to merge in local pride. The new organisation should thus become the focus of a local patriotism affecting the whole business of cattle-rearing and milk production. Moreover, it should help to concentrate the farmer's attention on his proper job. One of the weaknesses of English agriculture is that the producer, who is often trying to sell wheat, pigs, milk, beef, mutton, wool, eggs, and many other products, cannot possibly study his markets adequately. Difficulties of packing, transport, and even public taste are always taking his mind away from his primary task of production, and the countryside needs centres which will receive the various forms of produce, handle them in large quantities, and distribute them in the quarters where they are needed in the form in which they will be acceptable. An organisation like Bladen Dairies is making a beginning with this task of rationalising the countryside, but if it could enlarge its scope to comprise the grading and marketing of eggs and fruit, for example, it would have even greater possibilities for improvement of the national life.

It is a far cry from the paper carton to decentralisation of pasteurising plant, and further still to the revival of the English dairy industry. The new method of packing has been tried before and abandoned, and we cannot yet say whether more efficient manufacture and design will bring it success this time. The problem is ultimately one of costs, but as has been seen, it has interesting medical implications. What remains to be mentioned is the possible influence of the carton in popularising milk as a food. The new Dorset undertaking is trying the experiment of selling its milk in London through grocers instead of the ordinary dairies. Its sponsors anticipate in this way making it easy for the casual shopper to include a carton or two of milk among the other purchases which go into her basket. They hope that the presence of real milk on the counter will discourage her from buying tinned or dried milks. And by issuing small cartons, containing one-third of a pint, at a penny, they believe they will encourage the consumption of milk by schoolchildren. Certainly the child's ration, at this low price, should be attractive to many parents, though it seems doubtful whether it will show any profit to the producers. For the rest, time alone will prove whether the sale of milk by all sorts of retailers is to be justified by results, but from the standpoint of public health the proposal has much to recommend it. A condition we would make is that the carton must be dated.

## PROF. NUTTALL'S RETIREMENT.

THE retirement of Prof. G. H. F. Nuttall from the Quick Chair of Biology at Cambridge, which he held from its foundation 25 years ago, has given his many friends and admirers the opportunity of offering him some token of their esteem. With this object a representative committee has been formed which has decided to collect a fund in order that his portrait may be painted by some eminent artist; a letter appealing for subscriptions to this fund will be found on p. 1101. No doubt the response will be large and immediate, for the services of Prof. Nuttall to preventive medicine are as eminent as his contributions to general biology. In 1901 he founded the *Journal of Hygiene*, and seven years later *Parasitology*; both these journals he has edited from their commencement. Whilst holding the chair of biology, he obtained funds to found the Molteno Institute of Parasitology at Cambridge, and has trained numerous research workers. In 1904 he was mainly responsible for instituting a diploma in tropical medicine and hygiene at Cambridge. His earlier contributions to medicine include the first demonstration (in 1886) of the bactericidal properties of blood-serum; the discovery (in 1892), jointly with Welch, of the gas gangrene bacillus; and especially his classical studies on precipitins (1901–04). His later activities have been directed towards the rôle of blood-sucking insects and other arthropods in the transmission of disease. The study of the structure and biology of mosquitoes, lice, bugs, and ticks, which this has involved, has resulted in a series of noble monographs. Nuttall's studies of endemic malaria in Great Britain, including the distribution of *Anopheles maculipennis*, were of great importance during the war when many cases of malaria were being introduced by troops returning from the Mediterranean and other centres of infection. Nor should we overlook his participation in the discovery of the specific action of trypan-blue on piroplasmosis.

# ANNOTATIONS

## THE MINISTER OF HEALTH.

Sir Edward Hilton Young, who has become Minister of Health with a seat in the Cabinet, has been closely associated with medicine as Crown nominee since 1926 on the General Medical Council, and for the last three years a member of its executive committee. Although the Medical Act of 1858 requires only the representatives on the Council of the medical corporations to be qualified for registration under the Act, up to the time of Sir Hilton's appointment no layman had actually sat on the Council. His name was put forward by the Privy Council as a result of strong feeling in Parliament that there should be some member of the Council to "represent the public," as this feeling was vividly if a little loosely expressed. Sir Hilton is a man of law and a man of letters who has served his country in many capacities, of which the most heroic was on the *Vindictive* at Zeebrugge Mole in 1918, when he was severely wounded. He has been on financial missions to India, Poland, and Iraq, three times delegate to the Assembly of the League of Nations, and chairman of the Royal Commission on the constitution of London University. Formerly Liberal M.P. for Norwich, he has since 1929 represented the Sevenoaks division of Kent as a Conservative. No appointment could have been more acceptable to the medical profession.

## OVARIAN HÆMORRHAGE.

HÆMORRHAGE from an ovarian blood cyst is probably commoner than is generally supposed. Of late years in this country R. K. Wilson [1] has reported six cases at the London Hospital, and D. Levi [2] three at St. Mary's, while on p. 1068 of our present issue Mr. Hodgson Boggon and Mr. A. J. Wrigley describe 13 seen at St. Thomas's. These and other writers are all impressed by the difficulty of distinguishing the ovarian hæmorrhage from acute appendicitis. Evidently diagnosis is usually impossible before operation, and since the only other condition likely to give the same symptoms is an ectopic pregnancy, it is well to be on the safe side and operate if in doubt. Moreover, although this kind of bleeding may clear up without intervention it is sometimes quite copious (F. B. Block [3]). Its origin has of course been much disputed, and the suggestion has been made that it represents an exaggeration of the normal process of rupture of the Graafian follicle. But several investigators, notably Wilfred Shaw,[4] have shown that rupture of the follicle and extrusion of the ovum is not accompanied by hæmorrhage into the central cavity, and that the corpus luteum is therefore in its earliest stages free from blood. During the stage of vascularisation, as the corpus luteum develops, a minute amount of bleeding normally does take place, to be organised and absorbed by the rapidly growing cells of the membrana granulosa, and again during the stage of involution there may be further slight hæmorrhage. The reason why these minute physiological hæmorrhages should reach alarming proportions has been studied among others by S. A. Wolfe [5] who has examined 32 ovaries removed at operation, all containing hæmatomas of various sizes. He notes that in six cases the hæmorrhage occurred during the development stage and in 26 during involution, but he thinks that some of the 26 probably started during development of the lutein body and that further bleeding took place during retrogression. General hyperæmia of the ovary is, he considers, the underlying feature of this excessive hæmorrhage, and he attributes it to associated pelvic disorders. Thus he found salpingitis in 27 out of his 32 cases and fibroids in three, and he supposes "static factors"—i.e., retroversion of the uterus and prolapse of the ovaries—in the remaining two. These findings are not borne out by other observers; Wilson's cases, for instance, were in perfectly healthy young women with no suggestion of pelvic inflammation. It seems likely therefore that while this condition may coexist with pelvic inflammation, we must look further for the underlying cause. Perhaps the most likely explanation of the hæmorrhages is that they are the result of sudden outbursts of activity of the ovary—perhaps under the influence of the pituitary gland. They are reminiscent of the hæmorrhagic follicles produced in animals by injection of the urine of pregnancy, in the Zondek-Aschheim test.

[1] THE LANCET, 1928, i., 1221.
[2] Brit. Med. Jour., 1929, ii., 641.
[3] Amer. Jour. Obst. and Gyn., 1930, xix., 102.
[4] Jour. Obst. and Gyn. Brit. Emp., 1927, xxxiv., 300 and 469.
[5] Amer. Jour. Obst. and Gyn., 1928, xv., 513.

## THE BLOOD-SUGAR IN CHILDHOOD.

THOUGH the blood-sugar of adults has been closely studied in a great number of conditions, our knowledge of the corresponding physiological and pathological variations in infancy and childhood is still far from complete. Since metabolism in early life is known to differ in many respects from metabolism in the adult, it is clearly desirable that information about the normal carbohydrate mechanism in different age-groups should be collected so that we may assess the significance of our findings in disease. E. Svengaard has therefore made a valuable contribution in her extensive study [1] of the blood-sugar, both in the fasting state and after glucose administration, in groups of children from 4 days to 13 years of age. She confirms the findings of several previous observers that the average fasting blood-sugar in early infancy is slightly lower (circa 0·08 per cent.) than in later childhood, when it approaches more closely to the adult figure, and she shows by repeated estimation in the same individual that variations in fasting blood-sugar tend to appear as broad waves rather than as sudden changes. She records a relatively slight rise in blood-sugar following the administration of 2 g. glucose per kg. in the newborn period, whereas in the first year of life values above 0·200 per cent. (with a duration of hyperglycæmia of under two and a half hours) are frequent. Four cretins investigated showed a somewhat slow rise in the blood-sugar curve before treatment, but marked hyperglycæmia after administration of thyroid. The findings of most interest from the pathological standpoint, however, are those in the cœliac state. A. B. McLean and R. C. Sullivan [2] and more recently O. Macrae and N. Morris [3] have described a flat type of curve in this disease, which, the latter authors show, contrasts with the normal rise in blood-sugar after a glucose test-meal seen in non-cœliac steatorrhœa. They favour the view that the cœliac curve

[1] Acta Pædiatrica, 1931, vol. xii., suppl. iv., p. 245, Copenhagen.
[2] Amer. Jour. Dis. Child., 1929, xxxvii., 16.
[3] Arch. Dis. Childhood, 1931, vi., 75.

is due to defective absorption of glucose. Svengaard confirms these findings, both with regard to the cœliac and non-cœliac conditions. It appears that the blood-sugar curve may therefore prove useful in confirming a diagnosis of cœliac disease, though further estimations are clearly needed both in the active and latent periods of the disease.

## THE BROAD TAPEWORM IN NORTH AMERICA.

THE spread of *Diphyllobothrium latum* in North America has exercised a good deal of attention during the last three years.[1] [2] As reported by our correspondent in the United States, in THE LANCET of Sept. 12th, a further contribution to our knowledge has now been made by Thomas B. Magath and Hiram E. Essex.[3] Examination of Minnesota waters has shown that the Mississippi watershed is free from infected fish, but that these are present in certain lakes which drain either into Lake Superior or through Lake Winnipeg into Hudson Bay. As to the likelihood of infection being carried down waterways, it has been found that development from the tapeworm egg will not occur at 4° C., and that this is the temperature which obtains at the bottom of the Great Lakes throughout the year. Lake Winnipeg, however, is in a state of continual turnover, its temperature is at most times suitable for larval development, it receives a large amount of sewage, and its fish are more heavily infected that those from the Great Lakes, especially at its head or southern end. The free-living coracidium lives for 12 hours only after escaping from the egg, even in sheltered laboratory conditions, but as soon as it enters the arthropod intermediate host larval development proceeds and continues for at least two weeks. There is, then, opportunity for considerable dissemination of these infected creatures whether by passive transportation or active migration, and it should be noted that these writers have added *Diaptomus sicilis* and *D. siciloides* to the arthropod hosts in which the coracidium can develop. As regards animals other than man which harbour the adult tapeworm, Magath and Essex have in the press evidence that while 80 per cent. of eggs from man develop active coracidia, only 1·5 per cent. of eggs from the dog do so. They accordingly conclude that man is the essential source of infection for man, and sewage the means by which that infection begins its complicated chain. This, however, does not necessarily follow. For example, dealing with malaria, E. Walch and B. Walch-Sorgdrager [4] showed that although in Sumatra the mosquito *Anopheles ludlowi* was about 12 times more often infected with these parasites in nature than was *A. sinensis*, yet since the latter outnumbered the former about 120 times, it was about ten times more dangerous to man locally than *A. ludlowi*. Similarly, since Vergeer [2] has found as many as 19 specimens of this tapeworm in one dog, it is unwise to assume than the part played by the dog in spreading infection to man is necessarily insignificant. But while this point remains to be settled, it is clear that adequate treatment of sewage must be held a prime factor in the prevention of dissemination. The complete avoidance of the eating of improperly cooked fish is a simple and certain personal preventive; while if public measures be demanded, it is pointed out that the proper freezing of fish imported from Canada to the United States will prove effective, since a temperature of −9° C. maintained for 48 hours kills all the plerocercoids in their flesh, and so prevents this, the infective stage, from reaching and parasitising man. These writers cannot agree then with Vergeer's suggestion that there is need for an embargo on the importation of susceptible fish into the United States from Canada, since by freezing these can be made quite safe. It is further clear that their investigations have made it possible, if not probable, that infection in Canadian fish is itself to some extent water-borne from the United States, so that the imposition of such an embargo would prove particularly difficult to justify.

[1] See THE LANCET, 1928, ii., 337.
[2] Ibid., 1929, ii., 780.
[3] Jour. Prev. Med., 1931, v., 227.
[4] Meded. Burgerlijk Geneesk. Dienst in Nederl.-Indië, 1921, Pt. 2, p. 2.

## INTOLERANCE IN PSYCHIATRY.

Dr Bernard Hart's appeal for tolerance and coöperation between all who are attacking the problems of psychiatry strikes a welcome note. Few things in medicine to-day are more distressing than the internecine strife of units that ought to be advancing together against the gravest health problem of our time. Nations are beginning to realise that the preservation of life is not the one thing of importance to a people; what really matters is the kind of life that is preserved. A dozen living persons suffering from mental disorder and inability to adapt to their environment may cause a community far more damage than the loss of a hundred lives from cancer or tuberculosis. Mental disorder of every kind, major and minor, is on the increase, and there are a dozen promising lines of approach to its prevention and cure. These methods range from the estimation of the blood cholesterol on the one hand to an intimate personal relationship on the other hand. It is impossible at this stage to say which is ultimately going to prove the most successful. It is extremely improbable that any one method will succeed in every case or that any one method alone, without the others, is to be trusted for any case. Yet there seems to be in this branch of medicine a peculiar difficulty in understanding the principles or even in admitting the claims of any practitioner belonging to a different group. Greater extremes of intolerance are met here than in any other branch of medicine. The mental hospital superintendent will point mockingly to the "results" of psycho-analysis that he has received into his wards, and the psycho-analyst will sneer at the "archaic" methods employed in mental hospitals. To say that these are extreme instances is no mitigation: they ought not to be possible at all in the face of the grave problem that superintendent and psycho-analyst alike are attempting to elucidate. The two should instead be making every effort to meet and talk over the patient whom they have in common with a frank readiness to confess mistakes and failures which ought to be no disgrace at this early stage of the development of psychological medicine. There is one point of agreement between these two schools, and that is their united condemnation of those who approach the problem from yet a third point of view, the point of view which has been named "mystical" as a term of reproach, though the term might well be accepted as one of reverent admiration. Here again Dr. Hart has said something that greatly needed saying. He has pointed out the essential mysticism in the modern developments of that which has always seemed its antithesis—the higher mathematics, and that the much-vaunted methods of science are after all only one approach to the knowledge of mankind. What, after all,

is science? It is the application of one part of man to the problems of the universe: the results which he is able to obtain by using his intellect. In so far as it deals with the part of the universe that is mechanical and mechanistic, this method has proved extraordinarily illuminating and is likely to go much further. But every man knows that his own experiences include much that is not intellectual, and every physicist is beginning to suspect that the universe does likewise. Is it probable, then, that the part can comprehend the whole? Is it likely that problems so far-reaching and so deep as those with which psychiatry is concerned can be solved by anything but a concerted attack by every method known to man?

## EARLY TUBERCULOSIS INFECTION A NORWEGIAN EXPERIENCE.

How and where are children infected with tuberculosis? In seeking answers to these two questions, Dr. H. J. Ustvedt [1] has made a special study in Trondhjem, which, with its limited population of about 55,000, and its well organised public health service, provided a comparatively transparent state of affairs, favouring the discovery of sources of infection. In the summer of 1930 some 5000 school-children were tested with tuberculin—by the Pirquet test as a rule. Previous notifications of tuberculosis showed that 521 children came from homes in which one or more cases of tuberculosis had existed during their life-time. But only 52·5 per cent. of these children gave a positive reaction. A re-examination of 100 negative reactors in this category with Mantoux's tuberculin test yielded only seven positive reactors. Even among the children who had been in contact with cases of fatal tuberculosis, and who had therefore presumably been exposed to massive infection, only 63 per cent. gave a positive reaction. Had the negative reactors escaped infection by virtue of otherwise healthy conditions of life and care taken to prevent infection? The explanation suggested in this question is unconvincing, seeing that in nearly all these cases the children lived under miserable conditions, in large communal barracks, with eight to ten persons living in each room. In each of 150 tuberculous families there were two or more school-children. In 46 of them all the children were negative reactors, and among the 104 families in each of which there was at least one child giving a positive reaction, there were only 50 in which all the children gave a positive reaction. In other words, in 54 homes there were positive and negative reacting children, herded together, all more or less equally exposed to home infection. After discussing various explanations of this phenomenon, Dr. Ustvedt concludes that the constitutional factor plays an important part, not only in the evolution of tuberculosis once acquired, but even in the acquiring of the primary infection. As to his second question, he was able to trace the origin of 1116 positive reactions in only 24 per cent. to infection in the children's homes. Had the remaining 76 per cent. been exposed to infection in the same house, though not in the home itself? A comparison was made between 1900 children coming from houses in which from one to four cases of tuberculosis had been notified, with the same number of children coming from houses in which no case of tuberculosis had been notified. The percentage of positive reactors was 22·5 in the former category, 17·5 in the latter—a very small difference. This percentage did, however, rise to 29·5 per cent. in the case of the houses in which five or more cases of tuberculosis had been notified. Even so, it would seem from Dr. Ustvedt's investigations that most school-children, living in a town like Trondhjem, acquire their tuberculous infections outside the home and outside the house in which they live. And this was apparently true even of the youngest school-children.

[1] Norsk Magasin for Laegevidenskaben, July, 1931.

## THE TITLE OF "DENTAL SURGEON"

THE Court of Appeal on Oct. 29th confirmed Mr. Justice Farwell's decision (discussed in THE LANCET on August 8th, at p. 302) that a registered dentist who has neither degree nor diploma is not entitled to use the title of "dental surgeon." The case was that of a practitioner admitted to the Dentists' Register under Section 3 (1) (*a*) of the 1921 Act by virtue of his previous practice. Section 4 of the Act allowed him to call himself "dentist" or "dental practitioner," but forbade him to use "any title or description reasonably calculated to suggest that he possesses any professional status or qualification other than a professional status or qualification which he in fact possesses." The British Dental Association contended that the description "dental surgeon" implies the possession of a degree, licence, or diploma. Mr. Justice Farwell, who heard the evidence of several witnesses, came to the conclusion that, though to many people the term "dental surgeon" had no particular significance, to many others it did imply the meaning for which the British Dental Association contended. In the circumstances the judge considered it was impossible to say that the use of the title "dental surgeon" would not reasonably suggest to a considerable number of the public that the defendant had some status or qualification which he did not in fact possess. In his confirmatory judgment the Master of the Rolls observes that the word "surgeon" expresses a distinct qualification, and the only issue is whether it suggests a qualification which the defendant does not possess. It was not necessary, said Lord Hanworth, to call the whole world to give evidence. "The question must be what the expression means to those instructed and educated with a knowledge of such matters." The Court of Appeal was satisfied that the use by the defendant of the expression "dental surgeon" was calculated to suggest the possession of a qualification not in fact possessed.

## THE FUNCTIONS OF VITAMIN A.

THE position of vitamin A as an "anti-infective" factor has been considered in two recent leading articles (Oct. 10th and 24th), but deserves an additional note. L. C. Boynton and W. L. Bradford report [1] on the differing effect of intraperitoneal injections of a certain organism in rats on diets deficient in vitamin A or vitamin D and rats on diets containing the missing vitamin. The organism used was a bacillus of the *mucosus capsulatus* group, which had been recovered from suppurating lesions of the upper respiratory tract in other rats on a diet deficient in vitamin A. Each animal received only a single injection and the dose used was just less than the minimal lethal dose for a normal rat. Groups of rats were inoculated at the end of 4, 6, and 8 weeks on the deficient diet and it was found that the survival-rate was unaffected by the withholding of vitamin D, but markedly lowered by the withholding

[1] Jour. of Nutrit., 1931, iv., 323.

of vitamin A. H. C. A. Lassen [2] also has given a very full account of somewhat similar work in which rats on diets deficient in vitamins A, B (vitamin B complex), or D were orally infected with organisms of the paratyphoid group. Marked decrease of resistance was only found in those on the diet deficient in vitamin A. Though it seems improbable that there is a question here of the breakdown of any immunity mechanism other than that of the mucous membrane cells themselves, yet Lassen does adduce some evidence that it is not in the gut mucosa that the lowered resistance lies. For instance, it could not be demonstrated that the organisms passed the gut wall more rapidly in A-deficient rats than in normal ones, nor that infection could be secured with a smaller dose of the organism. Some evidence was also obtained that in the deficient animals the agglutinins were reduced, though the power of vaccination to evoke immunity was not. We have as yet therefore but little reason to suppose that the breakdown in immunity, which is associated with vitamin A deficiency, is due to any cause other than damage to the epithelial cells. One very interesting point is, however, corroborated by Boynton and Bradford. They found that a lowered survival-rate could already be demonstrated in rats which had only been four weeks on the diet deficient in vitamin A, although at that time the animals' reserves of vitamin A were by no means used up and the creatures were still growing well and apparently enjoying good health. This observation affords additional evidence that it is possible for the rat—and why not for the human organism?—to exist in a dangerous state of latent deficiency of vitamin A of which there is no sign at all except lowered resistance to mucous membrane infection. When we read that among 4100 patients attending an ophthalmological department of a hospital in the north of England during one year, 17 cases of xerophthalmia or night-blindness were seen (J. C. Spence [3]), it gives us serious food for thought. For on analogy with the rat, behind those 17 cases of overt deficiency would stand an unknown further proportion of cases, whose only symptom was their low resistance.

An attempt to use intensive therapy with vitamin A to prevent the spread of respiratory infection (common cold) among infants under two years of age has been made in a Canadian hospital, without apparent success, by H. P. Wright, J. B. Frosst, F. Puchel, and M. R. Lawrence.[4] The control group of babies received a good supply of vitamin A, including cod-liver oil, so that it is quite possible that though no difference between the control and the treated group was obtained, none was to be expected. The incidence of common cold in both groups was considerable, and though with much less vitamin A, it might very likely have been higher, the vitamin therapy certainly produced nothing in the nature of a general protection.

## THE CULT OF THE THERMOMETER.

AT a recent inquest Dr. F. J. Waldo remarked that in his opinion all mothers in England should possess a clinical thermometer with which to take their children's temperature if necessary. He went on to say that cases of measles in young children frequently came before him in which bronchopneumonia was the cause of death and he believed that children with measles would be more likely to be put to bed and safeguarded from this complication if mothers had realised that the child was feverish. There is, we think, likely to be some difference of opinion about the use of the clinical thermometer in the home. A mother who is unobservant enough not to notice a change in her child's condition at the onset of an acute infection or of a complication occurring in the course of some other disorder is unlikely to be able to make proper use of a clinical thermometer. The taking of a child's temperature is not quite as simple as it might appear and whatever site is chosen presents certain difficulties and dangers. Even in a children's hospital accidents with thermometers occur. Apart from this difficulty, is it likely that the type of mother to which Dr. Waldo is referring would be able to read a thermometer if she possessed one? In forewarning mothers of the imminent measles epidemic would it not be better to issue some simple instructions, for example, about the feel of a child's skin when feverish or the rapid breathing of pneumonia, than to encourage the use of the thermometer? In the more educated classes the danger of too much use of the thermometer is real. Dr. Robert Hutchison, opening a discussion some years ago on the diagnosis of obscure pyrexia in children, remarked that in some cases the only way to clear up a persistently baffling elevation of temperature was to banish the thermometer from the house. With this many practitioners will be in hearty agreement. There is another danger—namely, that inasmuch as serious disorders of childhood may occur with a normal temperature the amateur use of the thermometer may lead to a situation of false security. Appendix abscess, intussusception, and rheumatic myocarditis are examples of danger where fever may be absent. On the whole then clinical experience is against encouraging the cult of the thermometer although an intelligent knowledge of its use is of value on occasion. A good working rule is to have a thermometer in the house but to keep it somewhere where it is difficult to find.

## RADIUM UNITS AT L.C.C. HOSPITALS.

TREATMENT by means of radium is at present carried out mainly at Lambeth (general) hospital, the North-Western (fever) hospital, Hampstead, and Queen Mary's hospital for children, Carshalton. Lambeth has 512 milligrammes of radium and a deep X ray outfit, and the unit there is capable of carrying out the full range of radium work, although most of the cases of uterine cancer are treated at the North-Western which has 334 milligrammes of radium and no deep X ray outfit. Queen Mary's has 15 milligrammes of radium. At other L.C.C. hospitals radium treatment is carried out to a limited extent by means of needles, lent by the London hospital, and by radon seeds. The Central Public Health Committee states that there is no evidence of an unsatisfied demand for radium treatment in the Council's hospitals. The medical superintendents have experienced no difficulty in obtaining radium treatment for any patient requiring it. The patients treated at Lambeth hospital come mainly from areas south of the Thames and especially from the neighbourhood of the hospital. The voluntary hospitals in possession of considerable amounts of radium are mainly north of the river and their radium units are not all working to their full capacity. The radium at Lambeth is used approximately to maximum capacity, and its deep X ray outfit is adequate for

[2] Experimental Studies on the Course of Paratyphoid Infections in Avitaminotic Rats. With special reference to vitamin A deficiency. Levin and Munksgaard, Copenhagen. 1931. Pp. 248.
[3] Arch. Dis. Childhood, 1931, vi., 17.
[4] Canad. Med. Assoc. Jour., Oct., 1931, p. 412.

present demands. The unit at the North-Western does not make the maximum use of its supply of radium and the (8) beds in the unit are occupied only to about 70 per cent. of capacity. The margin of possible increase, with the present number of beds, is small. A more important limitation is the lack of equipment for deep X ray therapy which in the committee's opinion should be remedied, although they consider it would be unwise to spend a large sum of money on this hospital unit which would be more appropriately placed in a general hospital. In view of the present economic situation, it is felt to be inopportune to consider the transfer and expansion of the North-Western hospital unit if any other solution of the problem can be found. Though convenient and desirable, it is not essential that deep X ray therapy should be available in the same hospital as radium treatment. The Marie Curie hospital for instance gives radium treatment but sends its patients to the Royal Free hospital for X ray treatment. It has therefore been decided for the present to send patients from the North-Western to Lambeth for X ray treatment, and should the resources there become strained, to make arrangements for X ray treatment at one of the voluntary hospitals.

## ALBUMINURIA IN PREGNANCY.

G. F. Gibberd's views on the prognosis of albuminuria in pregnancy [1] are supported by those of C. H. Peckham and M. L. Stout,[2] of Johns Hopkins Hospital, Baltimore. Since 1927 a special "toxæmic clinic," antenatal and postnatal, has been in existence in the obstetric department there. Excluding eclampsia and hyperemesis gravidarum, 545 consecutive cases of toxæmia of pregnancy were admitted and delivered in the hospital during the four years 1927–30, and this figure represents a toxæmic incidence of 10 per cent. of all in-patient deliveries. Peckham and Stout consider that a diagnosis of chronic nephritis is established if four months after delivery a patient has either hypertension—i.e., a systolic blood pressure of 150 mm. Hg or more, or a diastolic blood pressure of 100 or more—or persistent and definite albuminuria. Adopting this definition of chronic nephritis, they find that one out of every three of their toxæmic patients ultimately develops chronic nephritis; in other words, 3–4 per cent. of all the women delivered in the hospital develop chronic nephritis. Pregnancy is thus again brought forward as an important ætiological factor in chronic nephritis.

An attempt has been made by Peckham and Stout to distinguish the toxæmias that are secondary to, or will end in, chronic nephritis from those that will resolve completely, and several interesting clinical observations have emerged. It seems that nephritis is seen more frequently in the older age-groups and among multiparæ; two-thirds of the non-nephritic toxæmias occurred in women under 25, and two-thirds in primiparæ. A marked hypertension—systolic pressure of 200 mm. or more, and diastolic of 150 or more—is more often associated with nephritis, although an occasional case of pre-eclampsia is seen with this reading. Albuminuria and its amount they regard as of no prognostic import. The presence or absence of casts in the urine is likewise held to give no differential information. Œdema appeared in the same proportion of cases in the two groups. Even six weeks after delivery many normal women still had hypertension and albuminuria, while a small number of nephritic patients seemed to be normal in these respects. Only 7 per cent. of non-nephritic patients showed hypertension or albuminuria before the seventh month of pregnancy, whereas over half the nephritics were by that time known to be abnormal. However, almost a fifth of the women who ultimately were diagnosed as nephritic were known to be normal until after the seventh month. This seems to indicate that chronic renal damage may be a result of the toxæmic process.

A second paper is published from the same clinic by H. J. Stander and C. H. Peckham,[3] entitled Prognosis in Nephritis Complicating Pregnancy. A total of 236 cases in the ten years 1919–28 are reviewed, and the most important conclusions are the following, which we quote in full: (1) "The maternal mortality occurring within ten years in our series is appallingly high, being 42·53 per cent. The average mortality for women between the ages of 30 and 40 years in this country is 7·5 per cent." (2) "The prognosis in chronic nephritis complicating pregnancy is very grave, the average duration of life after definite diagnosis had been made, being only three and thirty-seven hundredths years in the fatal cases. On the other hand, only 4 of the 50 nephritic women now alive have had subsequent pregnancies, and to date their average duration of life is six and twelve hundredths years, following the diagnosis of chronic nephritis." (3) "The fœtal mortality in our series of pregnant women is over 21 per cent. in viable babies, as compared with 9·5 per cent. for all patients in our clinic." It is important to realise that the cases analysed in these two papers are not comparable, for the second one includes only cases where a diagnosis of chronic nephritis could be made during pregnancy. It would be of great interest if these workers would collect and publish the remote results of the cases of chronic nephritis described in the first paper, with particular reference to the interference with the normal average expectation of life and health.

Sir Robert Jones will deliver his Mitchell Banks lecture, on the Problem of the Stiff Joint, in the Medical School of the University of Liverpool on Thursday, Nov. 19th, at 4 P.M.

THE twelfth Maudsley lecture of the Royal Medico-Psychological Association will be delivered by Sir Hubert Bond on Tuesday, Nov. 24th, at 3 P.M., in the Great Hall of the British Medical Association, Tavistock-square, London, W.C. The title is Testimonied in his own Bringingsforth.

[1] THE LANCET, Sept. 5th, p. 520; Sept 12th, p. 576; and leading article on Oct. 31st, p. 969.

[2] Bull. Johns Hopkins Hosp., October 1931, p. 225.

[3] Amer. Jour. Obst. and Gyn., Oct., 1931, p. 626.

RED CROSS BLOOD TRANSFUSION SERVICE.—The Medical Research Council and the British Red Cross Society have appointed Dr. H. F. Brewer, senior demonstrator of pathology at St. Bartholomew's Hospital, to be medical officer to the blood transfusion service organised by the Red Cross. Dr. Brewer will supervise the examination of transfusion volunteers, and the collation of information on the effect of blood transfusion on donors, and carry out active and continuous research into blood grouping, so that the service may be kept abreast of the latest developments in surgery and hæmatology. Laboratory facilities are being provided by St. Bartholomew's Hospital. The London service covers an area of about 70 miles round the metropolis.

# SPECIAL ARTICLES

## THE VITAMIN B CONTENT OF COMMERCIAL LIVER EXTRACTS AND STOMACH PREPARATIONS.

BY ESMÉ GILROY, D.Sc., M.B. EDIN.

*(From the Institute of Animal Genetics, Edinburgh University.)*

OBSERVATIONS upon the distribution in foodstuffs of the several factors of the vitamin B complex have shown that the antineuritic and anti-dermatitis factors usually occur together, although their relative concentrations varies in different foods. Egg white appears to be the sole example of a foodstuff in which the anti-dermatitis factor, vitamin $B_2$, is present unaccompanied by the antineuritic factor, $B_1$ (Chick and Roscoe, 1929), a finding which Chick and Copping (1930) have subsequently confirmed.

Aykroyd and Roscoe (1929) found that dried ox liver was an especially rich source of vitamin $B_2$, and that it was even superior to yeast in this respect, the capacity of a substance to promote normal growth in rats on a diet deficient only in vitamin $B_2$ being adopted as the method of assay. More recently Guha (1931) has reported a high vitamin $B_2$ content in the case of a commercial liver extract (Eli Lilly, No. 343). This extract could induce good growth in rats on a diet deficient only in vitamin $B_2$ in doses of 40–60 mg. daily, but if the diet were deficient also in vitamin $B_1$ a dose of even 120 mg. did not suffice to maintain growth at the normal rate.

### Present Investigation.

During the past year the vitamin B content of a number of commercial liver and stomach preparations has been investigated, and as the results indicate that the majority of these are rich in $B_1$ as well as in $B_2$ it seems desirable to publish the experimental records.

The rats used in experiments 1 and 2 were pure albino (Wistar) stock of the "London strain," supplied by the Glaxo laboratories; for the rats used in experiments 3 and 4 I am indebted to Dr. B. P. Wiesner, of the Institute of Animal Genetics, Edinburgh; the latter were also Wistar stock.

In experiment 2 the rats were all of one litter; in experiment 1 two litters were used, as shown by the division line in Fig. 1. In experiments 3 and 4 litter mates were so distributed that the various groups of animals, as subdivided for testing the extracts, were comparable in respect to their genetic constitution.

The young rats, when 40–50 g. in weight, were placed upon a deficient diet of the following constitution:—

| | |
|---|---|
| Sifted rice starch | 60 parts. |
| Caseinogen (inactivated) | 20 ,, |
| Cotton-seed oil | 8 ,, |
| Cod-liver oil | 2 ,, |
| Salt mixture (M.) | 5 ,, |

The materials for this diet were supplied by the Glaxo laboratories, who stated that the cod-liver oil had a high vitamin A content, and showed a blue value of 10, as estimated by Drummond's modification of the Carr and Price antimony trichloride reaction, and that the vitamin D content was 150–200 (M.R.C.) units per gramme.

This basal diet was entirely deficient in water-soluble vitamins; lemon juice was omitted, as it is known that vitamin C is not necessary for growth in the rat (Hartwell, 1930), and it is possible that lemon juice may contain traces of vitamin B (Bacharach, 1925). Filter paper was supplied as roughage. In order to prevent refection the animals were kept on screens. After a period of 14–18 days on basal diet loss of weight occurred, and the material to be tested was added to the diet in amounts equivalent to 22 g. fresh liver (experiments 1 and 2), or 16 g. fresh liver (experiments 3 and 4). The dry liver preparations were dissolved in cold water, and the liquid extracts were diluted to a suitable extent, so that they could be thoroughly mixed with a small quantity of the basal diet, which was fed to the animals first; when this was finished the basal diet was given ad lib. Stomach extracts were fed dry, in doses of 0·5 g. In practice it was found that appetite increased to such an extent among rats receiving the extracts that it was necessary to feed 2–3 times daily; in cases where more than one rat occupied a cage the desire for the food containing liver was so great that a fight ensued, and care was taken that the weaker or more timid members had their fair share of the food.

The results of these experiments are shown in Figs. 1–4; a number has been assigned to each extract, prefixed with the letter "L" or "S" respectively, the former denoting a liver extract, and the latter a stomach preparation. One death occurred in the group of untreated controls shown in Fig. 3, on the twenty-seventh day of the experiment, as indicated at D, but after the addition of a stomach preparation on twenty-eighth day there was no further mortality, and a resumption of rapid growth was noticeable. Before the stomach preparation was added to the diet the animals in this control group were all extremely weak and emaciated, with complete loss of appetite. This demonstrates the fact that the basal diet was genuinely deficient in vitamin $B_1$, and that the excellent results obtained in the case of other preparations was not in any way due to traces of $B_1$ in the basal ration.

In the case of extract $L_4$ a temporary slight increase in weight occurred, but after six days growth was completely arrested. At $ASF_1$ a fraction soluble in 92 per cent. alcohol, which was discarded in the process of manufacture, was added in amounts equivalent to 16 g. fresh liver daily; this caused an immediate resumption of growth. Extract $L_5$ also failed to maintain normal growth; 0·5 g. acetone extracted wheat germ per head was added to the diet on ninth, tenth, and eleventh days after the extract had first been given, and then discontinued from twelfth to eighteenth day. By this time a loss of weight had again occurred, and a similar fraction soluble in 90 per cent. alcohol, derived from the extract, was given at $ASF_2$; in this case it will be seen that the alcohol soluble fraction had no effect on subsequent growth.

A twelfth liver extract was subsequently tested separately, and was also found to be an efficient source of vitamin $B_1$.

The extracts $L_1$, $L_4$, and $L_7$ were also tested for their vitamin B content in the Glaxo laboratories by Mr. A. L. Bacharach and Miss E. Allchorne, and I have permission to include in this paper a statement that they were able to confirm the present findings for the three extracts mentioned. The technique employed was similar, except that the extracts were administered by pipette instead of being incorporated in part of the basal diet; a similar dosage was employed—i.e., the equivalent of 16 g. of fresh liver per head per day. In their experience extract $L_7$ was slightly better as a source of $B_1$ than was extract $L_1$; the observation that $L_4$ did not induce growth was entirely confirmed, and a 50 per cent. increase in the dose caused no improvement, but the addition of 0·5 g. of wheat germ resulted in normal growth. If extract $L_4$ was given alone the experiment was terminated by death of the animals in less than 14 days after it was first administered.

Extract $L_7$ was the first to be tested, and, the requisite daily dose having been determined, this was adopted as a standard with which other extracts were subsequently compared; in every case dosage was calculated in terms of fresh liver equivalents. It was found that 1·0 c.cm. of $L_7$ gave very good growth, and that 0·5 c.cm. gave fair but subnormal growth, the latter being equivalent to 8·0 g. of fresh liver.

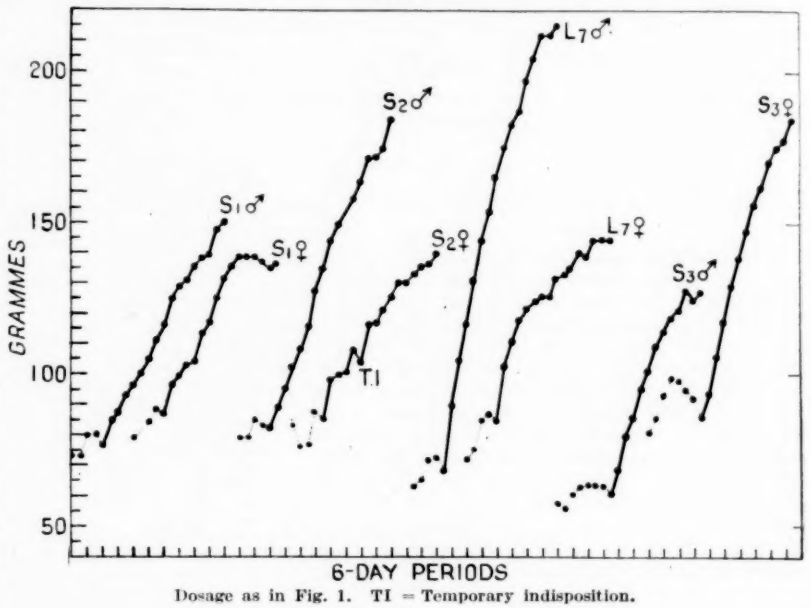
A comparison of the growth-promoting effect of $L_7$ and of acetone extracted wheat germ was also made, and it will be seen from Fig. 3 that the growth of animals receiving 1·0 c.cm. of $L_7$ was at least as good as that of rats receiving 1·0 g. of wheat germ as a supplement to the basal ration. As it seemed possible that the wheat germ might be a less efficient source of $B_2$ than was the liver extract fresh egg white was given throughout the next experiment to the control animals receiving 1·0 g. of wheat germ, but it will be seen that the growth rate in no case exceeded that of the rats which were receiving 1·0 c.cm. of $L_7$. It was also noted that if 0·5 g. of wheat germ was added to 0·5 c.cm. of extract $L_4$ the result was the same as if 0·5 c.cm. of $L_7$ had been given instead. Several other samples of dried yeast and wheat germ were subsequently tested and compared, and the results indicated that 1·0 c.cm. of liver extract was comparable in its $B_1$ content to 0·5–1·0 g. of such preparations, this in turn being equivalent to 16 g. of fresh liver.

The clinical significance of these observations may be appreciated if the $B_1$ content of the daily dose of $L_7$ for a pernicious anæmia case is estimated on the basis of the data presented above. The dose in pernicious anæmia is ½ fl. oz. ; ½ fl. oz. = 15 c.cm., 1·0 c.cm. = 1·0 g. of wheat germ, therefore the daily dose of $L_7$ is equivalent to approximately 15 g. of wheat germ, an amount which would hardly seem to be a negligible addition to the daily diet.

### GROWTH-PROMOTING PROPERTIES OF LIVER AND STOMACH EXTRACTS.

From the data obtained it was evident that with two exceptions ($L_4$ and $L_5$) the liver extracts used in these experiments, given in amounts equivalent to 16 g. of fresh liver daily, were able to induce excellent growth over a period of 30–40 days. It is to be noted further that the rate of growth was greater than that which is generally regarded as satisfactory —i.e., a weekly increment in weight of 20 g. per head. In one experiment, in which the larger dose of liver extract, equivalent to 22 g. of fresh liver, was given daily, the average weekly increase in weight for the first 27 days was in the case of one rat nearly 30 g. The remainder of the animals in this group also grew very rapidly, an increase of 3–4 g. daily being not uncommon for about the first four weeks ; reduction in dosage to the equivalent of 16 g. fresh liver induced a similar rapid growth.

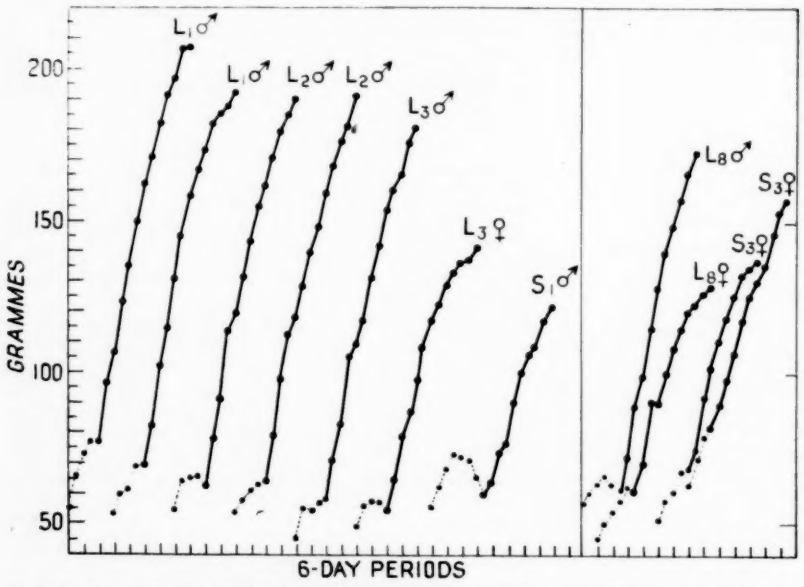
FIG. 2.




Dosage as in Fig. 1. TI = Temporary indisposition.

It is of particular interest that the rapid gain in weight was maintained for a considerable period ; an initial rise in the curve of growth in response to the correction of a dietary deficiency may be expected for a limited period of time, in compensation for the loss of weight during the preliminary period of deprivation, but in many cases it appeared that the rate of growth might not have diminished appreciably if the experiment had been more prolonged. This observation suggests that liver extracts possess growth-promoting properties which may be related only to a high vitamin content, or may be partly due to those protein derivatives which, according to the work of Dakin, West, and Howe (1930), are effective in the treatment of pernicious anæmia. In the case of extracts $L_4$ and $L_5$, which failed to induce normal growth, it is of interest that one of these, $L_4$, was ineffectual in this respect because its preparation involved the separation of a fraction soluble in 92 per cent. alcohol, which was discarded ; the addition of this fraction, as indicated in Fig. 3, resulted in a resumption of rapid growth. Extract $L_5$ was also made by a process in which a fraction soluble in 90 per cent. alcohol was rejected in manufacture, but in this case the restoration of the alcohol-soluble portion did not exert any effect upon the subsequent rate of growth. From certain information kindly put at

FIG. 1.

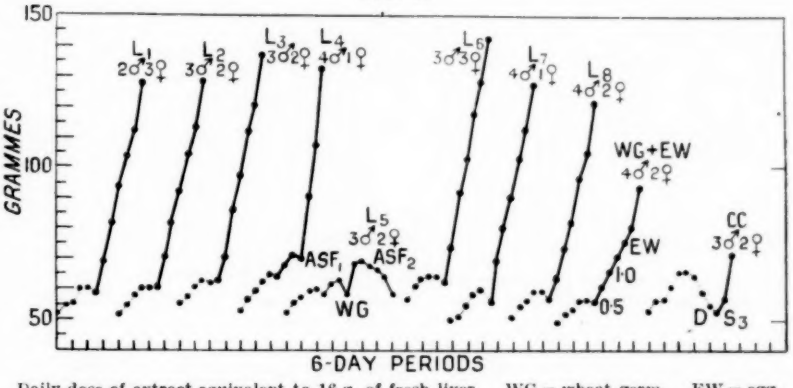



In this and subsequent charts treatment begins at termination of dotted line. Daily dose of extract equivalent to 22 g. of fresh liver.

my disposal by the makers of this extract it was evident that very slight alterations in the method of purification might cause destruction of $B_1$; the reasons for this inference cannot be further discussed here.

With the exception of $S_4$ the stomach preparations were quite efficient sources of those factors of the vitamin B complex which are necessary for growth in the rat. In general it may be said that the rate of growth induced was slightly less than that noted in the rats receiving liver extracts, but the stomach preparations were not tried on so many animals, and the smaller size attained by individual rats in experiment 2 could be attributed to a difference in sex.

FIG. 3.

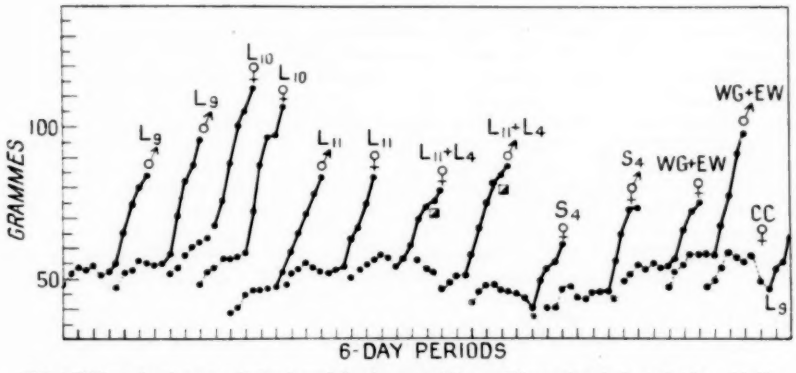



Daily dose of extract equivalent to 16 g. of fresh liver. WG = wheat germ. EW = egg white (fresh). S = stomach. $ASF_1$ and $ASF_2$ = alcohol soluble fractions discarded from $L_6$ and $L_7$ respectively. CC = untreated controls. D = death of rat.

### SURVIVAL OF $B_1$ AND $B_2$.

The facts which have emerged from this study of the growth-promoting effects of liver and stomach preparations, as used in the treatment of pernicious anæmia, justify the conclusion that both are naturally rich in vitamins $B_1$ and $B_2$, and that only in exceptional cases does the process of manufacture exclude the first factor of the complex; it is seldom actually destroyed, as the method of preparation is not liable to cause any inactivation. It is more remarkable that vitamin $B_2$ is not destroyed, or at any rate partially inactivated, in the process of manufacture, since this always involves extraction, or washing, with alcohol of a strength which should cause considerable loss of $B_2$ according to the work of Chick and Roscoe (1929), and more recently of Chick and Copping (1930). Sherman and Sandels (1929, 1931) carried out quantitative estimations on the solubility of vitamin $B_2$ in neutral alcohol of varying concentrations, and found that 95 per cent. alcohol did not materially diminish the potency of $B_2$ in dried yeast, but that the solubility of the vitamin increased as the concentration of the alcohol was reduced. They also observed that a similar concentration of alcohol extracted different proportions of $B_2$ from various foodstuffs, indicating that it was necessary to consider not only the nature of the solvent, but also the chemical and physical nature of the source material, in determining the solubility, or extractability, of $B_2$. Differences in pH are known to modify the sensitivity of $B_2$ to alcohol, according to the work of Chick and her collaborators, but it seems unlikely that commercial liver extract would be a sufficiently acid medium to protect the vitamin completely, and it must be assumed that some other factor is responsible for the survival of vitamin $B_2$ in proprietary liver extracts.

FIG. 4.




WG + EW = wheat germ (1·0 g.) and fresh egg white. CC = untreated controls. At the points marked by half blacked squares $L_{11}$ was stopped. At the asterisks $L_{11}$ was substituted for $S_4$.

### PERNICIOUS ANÆMIA OF PREGNANCY.

It is of interest to note that in certain parts of India anæmia of "pernicious" type occurs among pregnant women, and that this may be correlated with certain dietary deficiencies, notably a lack of vitamins, including vitamin B (Wills and Talpade, 1930). Gulland and Goodall (1925) had recorded the fact that in women pernicious anæmia was frequently associated with pregnancy, and it seems possible that a diet which is sufficient under ordinary circumstances may be inadequate for the pregnant woman. It is known that more vitamin B is required for lactation than for growth (Sure and Schilling, 1928; Evans and Burr, 1928), and many other workers have recorded similar observations. It appeared to be of interest therefore to compare the maintenance dose of liver extract in normal adult unmated animals with that required for pregnancy and lactation, and a small series of experiments were carried out in order to obtain data on this point.

Using albino mice it was found that a dose of the extract $L_7$ which was sufficient to prevent loss of weight in unmated animals on a diet deficient in vitamin B was not sufficient during gestation. Double this maintenance dose, if added to the basal diet from the first day of the experiment, permitted 2/4 mice to produce litters at normal term; if

given on the third day 2/6 animals gave birth to normal litters at term, but if given on sixth day only one out of five produced a litter. If the maintenance dose for unmated mice was given none of the animals in a group of ten was able to proceed to term. The animals were assumed to be pregnant if a vaginal plug was found after the introduction of a male, but as a plug is not invariably followed by pregnancy allowance must be made for this in considering the significance of the observed results.

The high correlation between the amount of liver extract given in the various groups and the proportion of animals achieving full term suggests that such treatment was effectual when started at a sufficiently early date, and the fact that not one out of ten mice went to term on the normal maintenance dose would seem to indicate that the latter was quite insufficient for gestation.

## Discussion.

The isolation from a liver fraction of a crystalline salt (West and Howe, 1930), which was shown to be effectual in the treatment of pernicious anæmia, is generally considered to disprove the earlier belief that the active principle of liver was of the nature of an enzyme or catalyst. Even before this important advance it was realised that liver is not the sole source of active principle, in view of the fact that preparations of other organs, such as stomach, had an equal therapeutic effect. It thus became evident that the anti-anæmia factor was not specifically elaborated by the liver, but was present in other glandular tissues.

Despite the undoubted value of the discovery that a crystalline substance could replace the original organ extracts, and that owing to its relative purity it could be subjected to an exact chemical analysis, its isolation does not shed much light upon the ætiology of the disease, except in one important respect. Among the products of hydrolysis of the crystalline substance Dakin, West, and Howe (1930) identified $\beta$-hydroxy-glutamic acid and hydroxyproline; Cohn, McMeekin, and Minot (1930) had concluded from their own investigations that the active principle was not an amino-acid, but a nitrogenous base. In either case it was evident that the constituents of the substance in question were protein derivatives, which would seem to indicate that in pernicious anæmia some phase of protein metabolism is at fault. Gulland and Goodall (1925) state "in many cases, indeed, of the cryptogenetic type we have the impression that a metabolic failure is a more likely cause than any other, perhaps in the direction of some abnormality in protein metabolism." It has been recorded by Fontes and Thivolle (1930) that injections of histidine and tryptophan have proved curative in a small number of cases; it has also been noted by Pal (1931) that histidine alone increases the erythrocyte count. Fenyes (1930) has concluded from the results of experiments on rabbits that histamine is indicated in the treatment of pernicious anæmia, as he found that it caused a marked rise in the red cell count, and in hæmoglobin percentage. Quite recently Dakin and West (1931) have reported the isolation of a pyrrole derivative, a tribasic acid, which causes a slight increase in the reticulocyte count in pernicious anæmia.

### THERAPEUTIC EFFECTS IN PERNICIOUS ANÆMIA.

If the administration of simple amino-acid mixtures, in various combinations, can effect a cure in pernicious anæmia, it must be assumed that in that condition the body is unable to utilise existing stores of protein derivatives for the specific purpose of blood regeneration. In pernicious anæmia, in contradistinction to the secondary anæmias, there is in the system an accumulation of the products of blood destruction. It appears that the amino-acids which under normal conditions form the raw material for hæmoglobin synthesis, and blood formation in general, are in some way bound so that they are incapable of assimilation, with a consequent arrest of hæmopoietic function. $\beta$-hydroxy-glutamic acid and hydroxyproline might be of considerable importance in blood formation and for the synthesis of hæmoglobin in particular, as the first of these, according to Dakin (1919), can be converted into hydroxypyrrolidone-carboxylic acid, and he points out that "such changes may well be associated with the synthesis of substances containing the pyrrol nucleus." If it is assumed that in pernicious anæmia there are in the body stores of nitrogenous material which are incapable of utilisation, then such a condition should be curable by either of two therapeutic measures. In the first place the administration of pure substances necessary for blood formation should permit a resumption of hæmopoietic function; in the second it should be possible to mobilise existing protein derivatives if a suitable catalyst were employed. The first method is apparently in operation in modern methods of treatment by the administration of amino-acid salts; the second it seems may have been included in the older methods, in which the administration of organ extracts, prepared by a process which ensured the retention of labile substances, was the basis of clinical research.

### PART PLAYED BY VITAMIN B.

It is possible that vitamin B may contribute to the therapeutic effect of liver and stomach preparations in pernicious anæmia, as it has been suggested that one or more of the factors of the complex is intimately concerned in protein metabolism (Reader and Drummond, 1926; Hartwell, 1928); it is therefore quite possible that vitamin B may play the part of catalyst in that particular phase of protein metabolism which is here involved, in the manner referred to above; according to Hassan and Drummond (1927) it is vitamin $B_2$ which is chiefly concerned.

This hypothesis, that vitamin B may play a part in the treatment of pernicious anæmia by organ extracts, and that lack of it may be a contributory factor in its causation, has only recently received clinical support. Wills and Talpade (1930) recorded the fact that mothers of premature infants frequently suffered from an anæmia in which the blood picture was identical with that of pernicious anæmia, and that they were generally found to be subsisting upon a diet which was markedly deficient in vitamin B. In a further communication, Wills (1931) provides indisputable evidence that a commercial yeast concentrate (Marmite) is as effectual in the treatment of this type of anæmia as is liver extract; her cases included both pregnant and non-pregnant women but no men. Davidson and Gulland (1930) remark: "The occurrence of a megaloblastic anæmia in association with pregnancy is sufficiently common to justify the statement that the strain of child-bearing appears to be an exciting or releasing factor in producing this type of anæmia in certain women." Reference has already been made to the observation that, experimentally, lactation greatly increases the demand for vitamin B. The small series of experiments on mice recorded here, although inadequate to establish the point, suggest that in pregnancy also an augmented supply of vitamin B is required, and that it may play a part in preventing abortion

and maintaining the general health. The vitamin B content of diets, while sufficient for most ordinary purposes, may be inadequate in face of the demands imposed by pregnancy; in countries where the diet is commonly inadequate the incidence of "pernicious anæmia" among gravid women may be correspondingly increased.

Wills (1931) refers to the complete lack of response to vitamins A and C in similar cases; it is therefore impossible that the yeast extract owed its activity to either of these. As the author points out, it is quite probable that the same protein derivatives which occur in liver extract might be present also in a concentrate of yeast, but she adds the comment "the fact that the condition is so common among the better-to-do classes, and among Mohammedans, who are meat-eaters, would suggest that a protein deficiency is not the underlying defect." The possibility that a vitamin deficiency might be involved in the causation of anæmia of the pernicious type has been referred to by Berg (1923), and by Dhar (1926). The anæmia of sprue, in which the blood picture is identical with that of Addison's anæmia, is successfully treated with liver extract (Richardson and Klumpp, 1928; Bloomfield and Wyckoff, 1929). Manson-Bahr and Willoughby (1930), who regard an ultramicroscopic virus as the causal organism, nevertheless recommend liver and fresh vegetables as an efficient form of treatment in that disease. It is to be noted that if liver extract, as opposed to whole liver, is active in the treatment of the anæmia of sprue, this disproves the suggestion that fat-soluble vitamins are chiefly concerned, as these are absent in the case of the extracts, being found in considerable amount in the residue rejected. Sprue is, most probably, a multiple deficiency disease, the other phenomena observed, such as the characteristic stools, being related to a fat-soluble vitamin deficiency.

The majority of the anæmias of nutritional origin are of secondary type, as in "rice disease" of rats, but it appears that in these conditions copper and iron are without effect (Whitehead and Barlow, 1929), and that fat-soluble vitamins are not curative, although the anæmia responds to treatment with 2 per cent. yeast. Barnett Sure (1929) records marked hæmopoietic disturbance with loss of serum proteins and slight œdema in the anæmia of avitaminosis, and it is to be noted that œdema was a striking feature of the cases described by Wills. Sherman and Smith (1931) refer to the existence of a vitamin B factor which may influence and regulate the distribution of water in the tissues, and be involved in the development of œdema in association with beri-beri; slight œdema is common in cases of typical Addison's anæmia. According to Yushiua, vitamin deficiency is accompanied by an increased katabolism of body protein which is not compensated by forced feeding of rich nitrogenous foods; Krauss (1930) found that yeast possessed definite powers in stimulating the regeneration of hæmoglobin.

Although it is improbable that the antianæmic factors of Dakin, West, and Howe, and other workers can be identified with vitamin B, it is of interest that the antineuritic factor has been generally considered to contain the pyrimidine ring, or a substance related to it in chemical structure. It would seem that $B_1$ would be liable to isolation in the same fraction of liver as the antianæmic factor of Cohn, McMeekin, and Minot (1930), since the latter is soluble in 92 per cent. alcohol, and appears to be precipitated by similar reagents. Cohn, Minot, Alles, and Salter appreciated this possibility, and tested various sources of vitamin B in a small number of pernicious anæmia cases. In only one of these did improvement occur during the period of observation, although large doses were employed, but treatment was only given for eight days. These findings appear to exclude the possibility that the antianæmic substance is identical with any known factor of the vitamin B complex, but if formation of the specific substance depends upon a reinstatement of normal metabolic function which can be effected by vitamin B, a delayed result from vitamin therapy might be anticipated. Alternatively, following the successful administration of liver extract, vitamin therapy should be able to maintain a cure. In support of the latter alternative it can be stated that this procedure has been adopted recently in a small series of cases with satisfactory results; the period of observation to date is only three months, but it seems improbable that a normal blood picture would be maintained for this length of time as a result of the short preliminary treatment with liver.

The symptom-complex found in pernicious anæmia presents many features which are suggestive of a chronic deficiency of vitamin B. It is stated by Davidson and Gulland (1930) that "some loss of appetite is usual, and sometimes this is as extreme as in gastric cancer"; anorexia is a prominent feature in deficiency of the antineuritic factor of vitamin B. Lack of $B_2$ causes "a very unhealthy condition of the whole alimentary tract, especially in the small intestine, which showed signs of inflammation with atrophy of the mucous membrane, and often contained blood-stained mucus." (Reference to the findings of Chick and Roscoe, 1927, quoted by Sherman and Smith, 1930.) The occurrence of œdema in avitaminosis has already been mentioned, and other phenomena, particularly in relation to the nervous system, occur as a result of vitamin $B_1$ deficiency, and are present also in the pernicious anæmia syndrome.

### NERVOUS LESIONS OF PERNICIOUS ANÆMIA.

Theoretically $B_1$ might be of considerable value in treating the nervous complications which are so characteristic a feature of pernicious anæmia, a fact which has been referred to by Castle and Taylor (1931) in connexion with the administration of liver fractions intravenously. Gildea, Kattwinkel, and Castle (1930) had previously shown that lesions of the central nervous system, comparable to those which occur in subacute combined degeneration in pernicious anæmia cases, could be induced experimentally in animals by deprivation of the antineuritic factor of vitamin B; lack of $B_2$ did not produce similar changes in the tissues, and the symptoms of its deficiency did not include paralysis, such as occurred in association with deprivation of $B_1$. The authors, in summarising their results, remark:—

> "Since the chronic deficiency, particularly of the antineuritic portion of vitamin B, appeared to produce in the dogs lesions closely resembling those occurring in human cases of combined system disease, in which achlorhydria is almost invariably encountered, it is suggested that the basis of the development of that disease may be a virtual deficiency of the antineuritic portion of vitamin B, brought about in some way by the achlorhydria."

In this connexion it may be noted that vitamin $B_1$ is alkali labile, and that loss of gastric acidity would provide conditions under which inactivation would be more liable to occur. It has been stated that liver extracts do not contain the antineuritic factor in significant amount.

Wills (1931) refers to a verbal communication from Chick, stating that "for a rat the minimum

doses of liver extract for the two vitamins stand in the relation of even less than 1 to 10." From the data now presented it is evident that such generalisation is contra-indicated, and must tend to cause confusion. Vitamin $B_1$ cannot be excluded as a therapeutic agent on the ground that it is absent from commercial liver extracts as a whole; its action may of course be subsidiary to that of vitamin $B_2$, or may be related to a separate group of symptoms.

It is appreciated that the "pernicious anæmia" of pregnancy, which has been shown to respond to treatment with marmite, may prove to be distinct from typical Addison's anæmia, and that the latter may prove entirely resistant to similar forms of treatment. The demonstration that the antineuritic factor is present, in addition to vitamin $B_2$, in the majority of commercial liver and stomach preparations may, however, be of interest in view of the possibility that certain factors of the vitamin B complex might be involved in cases presenting a blood picture which is identical with that of pernicious anæmia, as originally described.

## Summary.

1. Eleven commercial liver extracts and four stomach preparations were tested for their ability to promote normal growth in young rats on a diet deficient in all water-soluble vitamins. Nine of the liver extracts and three of the stomach preparations gave excellent growth. (A twelfth liver extract subsequently tested gave good growth.) From certain preliminary experiments it appears that a liver fraction for intravenous injection does not contain vitamin $B_1$.

2. The equivalent of 16 g. of fresh liver was found to be an efficient dose; half this amount induced fair but subnormal growth. Standardisation of the first extract to be tested showed that 1·0 c.cm. equivalent to 16 g. of fresh liver was approximately equivalent to 1·0 g. of acetone extracted wheat germ.

3. In the case of one of the two extracts which failed to support normal growth, the addition of a fraction soluble in 92 per cent. alcohol, which was discarded in the process of manufacture, permitted an immediate resumption of rapid growth. An alcohol soluble fraction rejected from the other extract failed to have any effect. In the two extracts referred to the amount of the antineuritic factor was considered to be negligible.

4. In a small series of experiments upon mice evidence was obtained that a dose of liver extract sufficient for maintenance in the normal, unmated, adult animal is inadequate during pregnancy. It appears possible that premature births, and other morbid phenomena, may be associated with a relative deficiency of vitamin B.

5. The significance of the antineuritic factor of the vitamin B complex in the ætiology of certain types of pernicious anæmia, and in the treatment of such conditions, is discussed, with reference to recent clinical observations.

A number of firms have kindly supplied me with liver and stomach preparations, and some of them have made a gift of the material for this investigation. Those from whom I have obtained extracts, and to many of whom I am greatly indebted, are Messrs. Allen and Hanburys, Ltd.; Armour and Co., Ltd.; Bencard, Ltd.; Benger's Food, Ltd.; Boots Pure Drug Co., Ltd.; British Drug Houses, Ltd.; Burroughs, Wellcome and Co.; Evans Sons Lescher and Webb, Ltd.; Organon Products; Parke, Davis and Co.

I also wish to thank Mr. A. L. Bacharach and Miss Allchorne for their kindness in carrying out experiments in confirmation of these observations.

The investigation was made possible by a grant from the Medical Research Council, for which I wish to express my thanks, and I am also indebted to Prof. F. A. E. Crew for scientific hospitality, and for his constant encouragement in this work.

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## THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 1038.*)

THE examination of witnesses continues. The father of one of the dead children said that after attending his wife the midwife told him that the infant might be protected against tuberculosis by the Calmette method. He had believed the compound to be a kind of vitamin. Had he been informed that it contained bacilli, however innocuous, he would not have agreed to its administration. When the infant died he reproached the midwife, whose reply was that she had done her duty by handing him the pamphlet, issued by the Lübeck Health Office, describing the Calmette method. Another midwife reported that as early as January, 1930, before its official introduction, an infant had been given B C G vaccine; although the child came of tuberculous parents it had not become ill. Another witness stated that the brother of a child became ill after licking a spoon used for administration of B C G. Evidence was given by a midwife to the effect that chickens who ate by accident of pap mixed with B C G and meant for an infant had died of tuberculosis, and their owner thereupon had brought an action for damages against the State of Lübeck.

Examined by Prof. Lange a midwife stated that she had herself taken a quantity of the compound to show the parents that it was quite innocuous. One of the midwives residing near the city though outside the State of Lübeck reported that when the administration of B C G was stopped she had not been informed nor were the tubes collected from her. Prof. Schümann, of Berlin, who had examined the bodies of 52 children, demonstrated before the court with the aid of lantern slides the result of the autopsies. He had been struck by the fact that a number of the children showed an infection of the lungs such as is produced only by inhaling tubercle bacilli. It was ascertained that one of the midwives had compressed the nostrils of the infants to induce them to swallow the B C G pap, swallowing in this way obviously being accompanied by a deep inspiration. Of the eight children attended by that midwife six had died from pulmonary tuberculosis. The great majority of the children showed a primary infection of the intestine.

In the course of the proceedings counsel for the parents said that although a group of medical men had taken Calmette's view, yet Prof. Deycke had not sufficiently considered the opposing opinions. Reproached by the presiding judge, he apologised for his expression. Counsel for Prof. Deycke blamed Calmette because he had declined to give evidence before the Lübeck court, but had nevertheless given in a German daily paper a very unfavourable opinion on Prof. Deycke and the other accused persons. Prof. Uhlenhuth, as representative of German medical science, regretted that anything had been said against Calmette in view of his great merit as a French scientist.

## SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

### EARLY MENTAL DISEASE.

In opening the new Wellwood Nursing Home, in connexion with the Aberdeen Royal Mental Hospital, Sir Ashley Mackintosh said that the whole trend of modern medical science was in the direction of prevention and early treatment, and in no branch of medical work was this more important than in mental illness, especially in the young. Scotland now has several homes of this kind, and the idea of prevention of nervous disorders is steadily gaining ground. A change seems to have come over both the lay and the medical mind. I can recall the fruitless struggles of the late Sir Thomas Clouston to get a footing for the "nervous" troubles in their early stages. The Scottish Central Board, as well as the mental hospitals, have long been ready for these changes. Even in the mental hospitals the number of voluntary patients steadily increases. But there is still a long way to travel before the resources of physical treatment for incipient patients can be fully utilised.

### FAITH IN THE MEDICAL PROFESSION.

At the recent Glasgow graduation in science and medicine Principal Rait said that there was a time when this ignorant and helpless world looked upon the medical profession as endowed with magical gifts, and regarded the medicine men as other than ordinary human beings. That this state of mind had altered was not because the laymen had acquired any familiarity with the fundamental principles of the science of medicine or of surgery. The lay world had still to trust the profession almost as blindly and as implicitly as it did in the state of society depicted by the anthropologists and the historical novelists. That trust was a responsibility which had been borne by the profession through many centuries—borne so honourably and so worthily that from the moment they began to practise, and before they had had time to give any proof of their own skill, the new graduates would receive a confidence which might seem to them pathetic in its simplicity.

## MEDICINE AND THE LAW.

### Posing as a Doctor.

Is not the system of appointing ships' doctors sometimes a trifle lax? The question is asked in view of remarkable evidence recently given at West Ham police-court during a prosecution under the Medical Acts. According to the account given by a representative of the Public Prosecutor, a young man named Charles John Powell, aged 21, previously a hospital attendant, decided last March to emigrate in search of employment. To obtain a passage to Australia he applied to the Commonwealth and Dominion Line for the post of doctor and surgeon. Being given a form to fill up, he apparently chose from the Medical Directory the name of a medical practitioner in Scotland whose surname began with the same initial letter as his own. This practitioner's qualifications (shown in the Register as "M.B., Ch.B. Ed., 1928") Powell inserted in the form, which he then signed with the practitioner's name. He was eventually posted to the s.s. *Port Denison*, and proceeded to Australia as ship's doctor, attending to several patients on the voyage. In August he applied to the shipping company in Australia to be taken on again in the same capacity, and he came back to England in s.s. *Port Arthur*. When required to report to the immigration authorities, he admitted that he was not the medical practitioner whose name he had adopted: he said he had gone to Australia in search of work. The magistrate asked what remuneration he had received. The answer was that Powell signed on at 1*s*. a month and his food, and had not in fact drawn his wages. The magistrate remarked that he would like to know if all the doctors on this line were rewarded with 1*s*. a month for their services. A detective-inspector in charge of the case explained that doctors who wished to travel from England to Australia, or vice versa, were carried free in this way. With the admirable fairness with which the police bring out any fact in favour of an accused person, the inspector said that Powell had never been in trouble before and greatly regretted what he had done. Nothing wrong had been noticed in his treatment of patients on the outward voyage; Powell had really come back in s.s. *Port Arthur* in order to attend the ship's captain, who had heart disease; his treatment (following, it seems, the instructions of genuine medical practitioners) had been very good. Powell himself explained to the court that the *Port Denison* did not generally carry a doctor, and the *Port Arthur* never carried one at all.

Up to this point the impression might well have prevailed that the accused was a public benefactor whose successful empiricism deserved generous recognition from the General Medical Council. The magistrate, however, took a different view. "You do not seem to realise," he is reported to have said to Powell, "that here you are, a man sweeping out a nursing-home, posing as a doctor and going on a long

voyage to Australia. You might have had several deaths on board, and, if people you treated had died, it is pretty clear you would have been charged with manslaughter. However, the Public Prosecutor asks me to deal with the case under the Medical Act. You must pay a fine of £5 and £3 3s. costs or 31 days imprisonment." Earlier in the proceedings the magistrate pointed out that, in signing the doctor's name, Powell had made himself liable to conviction for forgery. He certainly seems a fortunate young man; his journey to Australia and back has cost him very little. His fellow-passengers were fortunate too. He might not have managed surgical operations as successfully as he treated the captain's heart disease.

### Ambiguous Bequest ("London General Hospital Fund").

Mr. Gustav Boringer, late of Crouch End, Finchley, made a will on July 20th, 1928, by which he bequeathed the residue of his estate to "the London General Hospital Fund." There being no fund of that name, the trustees of the will had to obtain a decision of the Chancery Division as to the disposal of the money. One of the principles applicable to the construction of wills is that the courts must not ascribe to a testator any intention not expressed in his will, but they must give effect to every intention which the will, properly expounded, contains. Extrinsic evidence is admissible to explain what he wrote; it is not admissible if it merely shows what he meant to have written. The question, in fact, is not so much what the testator meant as what is the meaning of the words he used. Two claimants appeared in respect of Mr. Boringer's bequest. The London Hospital put in evidence by affidavit of the late Lord Knutsford's broadcast appeal in 1928 for 2,000,000 half-crowns; it contended that the London Hospital was a general hospital, and it gave reasons for the belief that Mr. Boringer was aware of the appeal on its behalf. The other claimant was the King Edward's Hospital Fund for London, an organisation which, as Mr. Justice Clauson observed in his decision, was established with the object of applying funds towards the benefit of the hospitals of London, "hospitals" being widely defined for the purpose. The testator, said the judge, had in mind the idea of a fund for hospitals generally; the King Edward's Hospital Fund for London must therefore be held entitled to the bequest.

Ambiguity in these matters is regrettable. The services of seven counsel were required to elucidate the conundrum inadvertently propounded by a generous testator. The two claimants were each represented by a K.C. and a junior; the trustees of the will had to appear by counsel, the next of kin were also represented, and, as the case concerned a charity, the Treasury Solicitor briefed counsel to express the views (if required) of the Attorney-General. The costs of these proceedings will not be exceptionally heavy, but the Hospital Fund will be the poorer by that amount.

### Reprieve of Boy Murderer.

The Home Secretary announces the reprieve of the death sentence passed at Lincoln Assizes on Harold Smith, aged 16, for the murder of his aunt. This accords with the usual practice. The Home Office representatives told the Select Committee on Capital Punishment that no youth under 18 years of age has been executed in this country for the past 40 years. Sir John Anderson's memorandum on executions in England and Wales in the period from 1901 to 1929 showed the Committee that in that period three males of 18 years suffered capital punishment, nine males of 19, and seven males of 20 years. Above the age of 21 considerations of clemency towards youth apparently have little effect: out of a total of 405 persons executed in that period, 148 were of the ages of 21 to 29. In 1924 the Departmental Committee on the Treatment of Young Offenders recommended that nobody under the age of 18 should suffer capital punishment. The more recent Select Committee on Capital Punishment, while desirous of abolishing the death penalty for an experimental period of five years, recommended conditionally that, if Parliament decided to retain the death penalty, the age should be raised to 21 "inasmuch as 21 is the age when full civil responsibility is assumed." Had Harold Smith been under the age of 16, Section 103 of the Children Act would have forbidden the death sentence from being either pronounced or recorded; in lieu thereof the judge would have had to pass a sentence of detention during His Majesty's pleasure in such place and subject to such conditions as the Secretary of State may direct. It seems undesirable that death sentences should be pronounced on young persons of 16 and 17 if it is reasonably certain that the penalty will not be exacted The jury's strong recommendation of mercy in Harold Smith's favour almost suggests that they thought his life was at stake. Such an impression would be needlessly cruel for him and for them. On the other hand, if he and they knew that the danger was unreal, the dignity of the judicial proceedings is diminished. The Home Office could abolish capital punishment forthwith, for persons under 21 or for all persons whatsoever, by tendering appropriate advice as to the exercise of the Royal Prerogative of Mercy. But the judges would still have to pronounce death sentences on persons over 16. Whether 18 or 21 be accepted as the minimum age for executions, the law as to the pronouncement of death sentences should be in harmony. Forms should suit facts in the administration of criminal justice.

## THE SERVICES

### ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt.-Comdr. E. C. Davis has been appointed to *Furious*.

### ROYAL ARMY MEDICAL CORPS.

Capts. T. Parr and D. W. M. Mackenzie to be Majs.

#### ARMY RESERVE OF OFFICERS.

Lt.-Col. M. G. Winder and Maj. J. I. W. Morris, having attained the age limit of liability to recall, cease to belong to the Reserve of Officers

#### TERRITORIAL ARMY.

Lts. S. J. Hartfall and H. B. Trumper to be Capts.

2nd Lt. W. M. Arnott, from 57th (Lowland) Med. Bde., R.A., to be Lt.

### INDIAN MEDICAL SERVICE.

Maj. J. H. Hislop to be Lt.-Col.

The undermentioned officers retire: Lt.-Cols. W. Tarr and A. C. Anderson.

Capt. George Durairaj Gnanamuttu, the relinquishment of whose temp commn. has been notified, is permitted to retain the rank of Capt.

### ROYAL AIR FORCE.

C. H. Smith is granted a short service commission as a Flying Officer for three years on the active list.

### DEATHS IN THE SERVICES.

The death of Deputy Inspector General of Hospitals and Fleets, Henry Lawrence Crocker, R.N., retd., took place at Plymouth recently at the age of 79. He entered the Naval Medical Service in 1876, and after seeing service abroad was promoted to fleet surgeon in 1893. After serving in the battleship *Rodney* in the Mediterranean and in the *Royal Arthur* flagship in Australia, he retired with the rank of Deputy Inspector General in 1906.

# CORRESPONDENCE

## NUTTALL PORTRAIT FUND.

*To the Editor of* THE LANCET.

SIR,—Last week Prof. Nuttall retired from the chair of biology at Cambridge, which he has held for 25 years, and his friends think that he should be presented with some token of the esteem and affection in which they hold him. There is no doubt he would very greatly appreciate a portrait by an eminent artist, and we have decided to collect a fund with this object in view. It is hardly necessary to point out the conspicuous services Prof. Nuttall has rendered to preventive medicine in the fields of bacteriology, immunity, hygiene, and parasitology, by his personal researches and encouragement to others. In addition he has founded and edited two of the leading journals concerned with hygiene and parasitology, and by his efforts has obtained funds to found the Molteno Institute of Parasitology. As a result, there has arisen a school of research workers, now scattered throughout the world, many of whom gratefully acknowledge the inspiration which they have derived from his teaching and example.

Contributions, not exceeding three guineas, should be made payable to Dr. C. M. Wenyon, *but sent to the address given below*, and cheques should be crossed a/c Nuttall Portrait Fund.

We are, Sir, yours faithfully,

| | |
|---|---|
| DAVID BRUCE | P. MANSON-BAHR |
| H. R. DEAN | GUY A. K. MARSHALL |
| CLIFFORD DOBELL | GEORGE NEWMAN |
| WALTER M. FLETCHER | A. B. RAMSAY (Master of Magdalene) |
| J. STANLEY GARDINER | L. E. ROBINSON |
| G. S. GRAHAM-SMITH | HUMPHRY ROLLESTON |
| M. GREENWOOD | C. WARBURTON |
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| J. C. G. LEDINGHAM | |
| G. C. LOW | |
| W. P. MACARTHUR | |

32, Belsize-avenue, London, N.W.3, Nov. 6th, 1931.

## RACIAL HERD-IMMUNITY.

*To the Editor of* THE LANCET.

SIR,—Your most interesting leading article on Racial Herd-Immunity of the Maori (Oct. 1st, p. 970), seems to bring indeed evidence of those, to my mind, very rare truly racial immunities, and by this I mean immunities based on hereditary factors. Yet, on the other hand, it shows how intricate the questions of racial differences in fact are, and how difficult it is to separate environmental factors from truly hereditary ones. I should like to point out a few items.

A few years ago I had the opportunity of examining medically many pure blood Eskimos and many mixed breeds on the North Coast of Labrador, and amongst these about 100 children pure and mixed. The cutaneous tuberculin test in these children gave the following results: 9·8 per cent. of positive reactions amongst pure Eskimo children (51 cases), and 56·2 per cent. amongst mixed breeds (32 cases). These figures show an overwhelming majority of infected cases in mixed breeds, nearly six times more amongst those who live in Eskimo country and Eskimo climate on European food, which means much tinned food, tinned margarine, bad flour, the mainstay often being tea, molasses, and ship's biscuits. The Eskimos, on the other hand, consume large quantities of raw seal blubber, raw seal blood, raw seal meat, and raw organs. Yet tuberculosis amongst Eskimos is always a very fatal disease; they succumb to it in a few weeks, and the disease is always of a galloping type. Now, in whites, tuberculosis is of very old standing, many thousands of years in fact, and, as is well known, chronic tuberculosis is the rule in Europeans, and acute tuberculosis of a galloping type the exception. We may conclude with Behring that in whites this is a sign of a beginning immunity, and instance of really racial peculiarity; whereas in Eskimos the juxtaposition of the results of the tuberculin tests and of the mortality to tuberculosis would not be convincing.

To take another instance, Orr, Macleod, and Mackie, in their Studies on Nutrition in Relation to Immunity,[1] have based their observations partly on experimental animals and partly on investigations into the nature of diet and incidence of disease in two East African tribes with different dietary habits. A survey of the incidence of disease taken in the native reserves showed that in the tribe with a diet consisting chiefly of cereals, pulmonary conditions, bronchitis, and pneumonia accounted for 31 per cent. of all cases of sickness, tropical ulcers for 33, and phthisis for 6, compared with only 4, 3, and 1 respectively in the tribe with meat, milk, and raw blood diet. In this tribe the chief disease was rheumatoid arthritis, associated with chronic constipation. Besides this, the cereal-eating tribe suffered generally from heavy infestation with intestinal parasites. In this case infectious and non-infectious diseases are brought into correlation with diet in two various native groups, and the apparent differences are striking.

Further, C. W. Daniels, in his text-book on Tropical Medicine, states: "Race is no protection to the negro who has been brought up in temperate and healthy climates when he returns to West Africa, the land of his forefathers." This will suffice. My point is, that it is very difficult to bring forward absolutely unimpeachable evidence of hereditary immunity in different races. A careful scrutiny of colonial medical literature at the library of the London School of Hygiene and Tropical Medicine on the subject of racial, or, as I prefer to call it, ethnic pathology, has provided me with more indications of environmental factors than of truly hereditary influences. Study of pathology in the different races shows how little we know about heredity in man, and how insufficient is genetic evidence based entirely on morphology. I am, Sir, yours faithfully,

V. SUK.

Masaryk University, Brno, Czechoslovakia, Nov. 4th, 1931.

## RADIUM BY MOUTH OR INJECTION.

*To the Editor of* THE LANCET.

SIR,—I have read Dr. Mutch's paper in your last issue (p. 1013) with considerable interest for several reasons. I am treating some cases of cancer by means of radioactive colloids; these are feebly radioactive. I have reason to be gratified by the results, but after reading an account of the later results of radium ingestion I have come to the conclusion that more prolonged observation on animals should be made before increasing the normal radioactivity of the human body. H. S. Martland reports,[2]

[1] THE LANCET, 1931, i., 1177.
[2] Amer. Jour. Cancer, 1931, xv., 2435.

amongst other results, nine cases of osteogenic sarcoma developing from four to ten years after cessation of contact with radioactive substances. His numbers are not large, but he concludes that the mortality from sarcoma in radium poisoning is 27 per cent. against 0·07 per cent. in the general community. It may be objected that the dosage of radium ingested in his cases was greater than that used therapeutically; this may be true, but where the residual radioactivity of the body was tested, the totals are not much larger than those advised by Dr. Mutch—the figures being 6, 14, 15, 30, and 50 microgrammes in those cases which were investigated.

Before I used radioactive colloid on humans I had its toxicity in mice and rabbits tested over ten weeks. Ten weeks for a mouse is about one-tenth of its expectation of life, and is sufficiently long a period over which to gauge early toxicity. But Martland reports cases of sarcoma developing after ten years cessation of ingestion. I have therefore started to observe the later effects on other series of rodents.

The experimental evidence of the toxicity of radium by injection or ingestion is mostly concerned with the early results, and usually large dosage. I would suggest that in view of Martland's findings much more work should be done on animals, using as many kinds as possible, and observing for much longer periods before the non-gaseous radium preparations are injected or ingested in man. A temporary, and even more a permanent, reduction in high blood pressure, &c., may well be too dear at the price of subsequent maxillary osteomyelitis, aplastic anæmia, leukæmia, rarefactive osteitis, and osteogenic sarcoma.

I am, Sir, yours faithfully,

Bristol, Nov. 7th, 1931. A. T. TODD.

## DANGER OF TREATING OPHTHALMIA NEONATORUM WITH MERCURIC PERCHLORIDE.

*To the Editor of* THE LANCET.

SIR,—It is generally recognised that a safe method of treating ophthalmia neonatorum is frequent washing out with 15 oz. of normal saline or saturated boric solutions at body temperature. In Brighton mild cases are treated at home by the Queen's nurses, the washing out being repeated four times daily, each treatment occupying half an hour. Care is taken to run the fluid gently into the inner canthus and not directly on to the cornea. The more severe cases are at once removed to hospital, where hourly treatment during the day and night always suffices to bring about an immediate improvement. The treatment is at times supplemented by drops of organic silver preparations once daily. Unfortunately, treatment with mercuric perchloride is still recommended in certain text-books and is at times prescribed for cases treated at home. The disastrous results of this treatment in combination with silver nitrate drops is evidenced by the following four cases, three of which are recent.

In three cases a solution of mercury perchloride, 1 in 10,000, was used, and silver nitrate (1 per cent.) drops at the end of the first and last daily treatments: in the fourth case perchloride and permanganate were used alternately, with silver nitrate drops twice daily. In only one case (E) was the attack of a severe nature at the onset. The patients were not seen by the doctor responsible until the seventh (E), eighth (J), seventeenth (W), and nineteenth (B) days of life, and treatment by district nurses was begun on the tenth, eighth, seventeenth, and nineteenth days. In each case, when the above-mentioned treatment was begun by the Queen's nurses, there was conjunctivitis and purulent discharge, but little or no puffiness, the eyes being easily opened. The treatment seemed at first to lead to a slight improvement with, in one case, a lessened discharge. In two cases (J and B) on the fourth and fifth day of perchloride treatment corneal ulcers suddenly appeared with considerable surrounding infiltration. In the case of W, improvement in the general condition was gradual up to the seventh day, and the nurse was astonished to find the cornea of one eye dead (completely infiltrated) on the morning of the eighth day, and in the afternoon of the same day a similar condition in the other eye, this without increase of discharge and without œdema of the lids. In the fourth case (E), on the third day of the alternate perchloride and permanganate treatment, the condition seemed to be improving with no ulceration of the cornea of the one eye affected; by the fifth day both eyes were in a bad state with marked œdema of the eyelids and pus welling out; on admission to hospital it was thought inadvisable to attempt to view the corneal condition, in case the necessary manipulation might aggravate the condition. From the time that these cases were put under treatment in hospital, and boric lotion substituted for perchloride lotion and colloidal silver drops once daily for silver nitrate drops twice daily, a gradual improvement immediately began. Unfortunately, permanent damage had already been done. E is blind in both eyes, W will probably be blind in both eyes, whilst J and B may possibly have sight in one eye.

Cases, whether treated at home or in hospital with frequent large washings (15 oz.) of normal saline or boric lotion, have never failed to improve, and it is only in the four cases mentioned, treated with mercuric chloride solution and silver nitrate drops, that uniform success has not attended treatment. I am driven therefore to conclude that the disastrous results in these four cases were caused by the perchloride of mercury, the silver nitrate or a combination of these acting on already weakened corneal tissue. Silver nitrate, even in 1 per cent. solution, is irritating; applied after the mercuric perchloride it would be to some extent precipitated as silver chloride with the formation of highly deliquescent mercury nitrate. I have inquired from the doctor in charge of one of our best-known maternity hospitals as to their practice, and received the following reply:

"Our practice is that every baby born gets 1 per cent. silver nitrate into each eye. This ensures absolute prevention. If the baby gets ophthalmia (which practically never occurs) 2 per cent. silver nitrate is used twice daily, and the eyes are washed out with boric lotion."

In view of the above statement, and the fact that in at least three of our cases the silver nitrate was rendered partly inert by its administration after the washing out with perchloride of mercury, I am not inclined to attribute the bad results of treatment to the silver nitrate drops. My impression is that whilst the large quantities of fluid used kept the eyes clean, the perchloride of mercury gradually weakened and finally killed the superficial layers of the cornea.

Whilst it may be interesting to speculate on the real cause of the disastrous results of treatment, the important thing is the recognition by writers of text-books and all practitioners of the danger of mercuric perchloride and silver nitrate treatments, and the recognition of the never failing efficacy of treatment with normal saline or boric lotion, with perhaps the occasional use of an organic silver preparation. My hope is that it will become generally recognised that (1) metallic disinfectants powerful enough to destroy organisms are harmful to the body tissues, and that therefore continued treatment with perchloride of mercury and inorganic silver nitrate is dangerous; and (2) fortunately, perchloride of mercury is unnecessary, as good results can be consistently obtained by normal saline or boric lotion.

I am, Sir, yours faithfully,

Brighton, Nov. 7th, 1931. DUNCAN FORBES.

## HIGH CARBOHYDRATE DIET IN DIABETES.

*To the Editor of* THE LANCET.

SIR,—I thank you for your courtesy in reporting my lecture on Recent Advances in the Treatment of Diabetes. I had not arranged the lecture with publication in view, and I should therefore be grateful if you would here allow me to add some other points that I have found to be of practical importance in the treatment of diabetes, though they are not yet established on a sound experimental basis that permits them to be harmonised in a general view of the pathology of the disease.

Some details were given for the diet of a new patient or of one just emerging from diabetic coma; but additional precautions need to be stressed in the management of an old patient for whom the change from the low to the high carbohydrate dietary may be desired. The first step on changing a patient over from a high fat to a high carbohydrate diet should not be made by merely reducing the fat whilst leaving the carbohydrate unaltered, for in insulin-treated patients symptoms of hypoglycæmia may be produced. By doing nothing beyond cutting the fat down at one blow to one-third or less of the amount previously administered to patients balanced on a high fat diet, I have, in a considerable number of cases, evoked marked symptoms of insulin overdosage, and indeed in one case, a child aged 8 years, the patient was swung over from a condition of persistent glycosuria to one of hypoglycæmic coma. The change over therefore when it is made must be direct from the high fat to the high carbohydrate diet. This is further supported by finding that there are certain diets with intermediate amounts of carbohydrate on which patients do not do well. Even with these precautions hypoglycæmic symptoms may still be induced and it is always as well if the patient cannot be kept under constant observation to make some slight reduction of the insulin before effecting the change to the high carbohydrate diet.

On these as on other diets the persistence of sugar in the urine passed after breakfast, long after it has cleared from all other specimens, is a striking feature. This phenomenon appears to be connected with the well-known fact that, in the diabetic, the blood-sugar does not fall during sleep but rises steadily. The idea occurred to me, from purely hypothetical considerations, that the giving of a carbohydrate meal, uncovered by insulin, about 11 P.M. or midnight, would prevent this nocturnal rise of blood-sugar, and thus abolish the after-breakfast glycosuria. The result in the majority but not in all of the cases was that not only did the sugar disappear after breakfast, but that glycosuria was not caused by the 11 P.M. meal. From the practical point of view one may say that if the patient is passing some sugar after breakfast, and there is no sugar in the urine passed either before breakfast or at the end of the previous evening, then the giving of carbohydrate at night—e.g., four Vita Weat biscuits and half a pint of milk—will probably clear up the morning glycosuria. It is surprising what quantities of sugar can be given in this late supper without sugar appearing in the urine, indeed one of my patients took 80 grammes of carbohydrate at night before his urine became sugar-free the following morning.

Finally, I should like to say that in patients on a high carbohydrate diet it has been my experience that, as recommended by Dr. E. P. Poulton, the best time to give insulin is often more than half an hour before meals. If mild hypoglycæmic symptoms continue to appear after meals in a patient in whom reduction of insulin produces glycosuria, by progressively increasing the interval between the injection and the meal symptoms may easily be abolished.

I am, Sir, yours faithfully,

H. P. HIMSWORTH.

University College Hospital Medical School, University-street, W.C., Nov. 9th, 1931.

## THE REGISTRAR-GENERAL.

*To the Editor of* THE LANCET.

SIR,—Prof. Greenwood's address, reported in your issue of Nov. 7th (p. 1024), has raised in my mind the question, Why should not the Registrar-General in England be a physician? I come to this question through reading his reports on occupational mortality. The form of their publication has changed in recent years. The supplement to the sixty-fifth report (Part II., published, 8vo, in 1908) was in fact a letter to the Registrar-General from Dr. J. G. Tatham on mortality in certain occupations during the years 1900–02, and was signed by him. A new series then began, and the supplement to the seventy-fifth report on mortality of men in certain occupations during the years 1910–12 (Part IV., published, foolscap, in 1923) is unsigned. The current decennial supplement for England and Wales (1921) on occupational mortality, &c. (Part II., published in 1927), is also unsigned. I have had occasion to use all these, especially the last, and found myself uneasy at first in studying it, as it bore, to support its far-reaching and novel conclusions, no name of anyone with a medical education to give the initial confidence felt in the suggestions of a medical colleague. I did not then know of the personality of the medical statistical officer behind them. It is difficult to see why the experience and prestige of so skilled a physician should not be quoted in support of his work. Indeed, the Registrar-General, who is a principal secretary of the Ministry of Health, has for his most vital duty the guidance of the Ministry in its policy by the collection of the relevant statistical studies, a duty he can only discharge through the inspiration of a wise physician. Why, then, is the source of that inspiration not declared nowadays, and why indeed should not the Registrar-General in England be a physician, as he has long been in Scotland?

I am, Sir, yours faithfully,

W. E. HOME,
Fleet-Surgeon.

Southborough, Kent, Nov. 8th, 1931.

## PULMONARY ASBESTOSIS COMPLICATED BY PULMONARY TUBERCULOSIS.

*To the Editor of* THE LANCET.

SIR,—In reference to the article by Dr. W. Burton Wood and myself on p. 954 of THE LANCET of Oct. 31st, our attention has been called to an error in quotation from Dr. E. R. A. Merewether. We state that "Merewether found evidence of active tuberculosis in the chests of three out of 374 asbestos operatives examined whilst at work." This should read *four* active cases, three of whom gave a family history, which makes the percentage figure 1·07 instead of 0·8 as stated. In addition to these four active cases Merewether found 33 inactive cases, making 37 in all, or 9·9 per cent. of the 374 examined.

I am, Sir, yours faithfully,

S. ROODHOUSE GLOYNE.

Nov. 5th, 1931.

## HUGHLINGS JACKSON FUND.

*To the Editor of* THE LANCET.

SIR,—Your readers will doubtless remember that in March last you published a letter signed by Sir Thomas Barlow and others inviting subscriptions to a fund to endow the triennial Hughlings Jackson lecture of the Neurological Section of the Royal Society of Medicine. No less than 131 subscribers have furnished a total of £1110, including 17 names from America, 2 from Holland, 3 from France, and 1 from Germany. Although we hoped to obtain a slightly higher figure—viz., £1200—yet, in spite of the non-materialisation of two promises amounting to £21, we shall be able to provide a gold medal as well as a fair honorarium for the lecturer. In these difficult times such a response indicates the devotion still existing to the memory of the master who left us 20 years ago.

The medal will bear on the obverse Hughlings Jackson's portrait, based on that published in *Brain* in 1906, and the execution of the die is in the hands of the well-known medallist Mr. James Metcalfe. The first medal will be presented to this year's lecturer Sir Charles Sherrington, O.M., F.R.S.

I am, Sir, yours faithfully,
WILFRED HARRIS.

Wimpole-street, W., Nov. 5th, 1931.

## CANCER OF THE CERVIX.

*To the Editor of* THE LANCET.

SIR,—It is unusual for authors to criticise the opinions expressed by reviewers, but there is one paragraph in your kindly review of my book "Diseases of Women," in your issue of Oct. 31st (p. 965), which I feel ought not to pass unchallenged. Your reviewer states:

> "It is unfortunate that Mr. Stevens should perpetuate the error that the most frequent variety of cancer of the cervix is the squamous epithelioma. By far the most common variety is columnar cancer; squamous epithelioma is really rare."

If this is really an error it is common to most text-books of pathology and gynæcology. For example, Eden, in a Manual of Gynæcology, states that "75 to 80 per cent. of all cancers of the cervix are squamous epitheliomata." The recognised authorities cannot all be wrong, and many years spent in histological research have convinced me that they are right. Thus it would appear that your reviewer is exceptional in the opinion expressed.

I am, Sir, yours faithfully,
THOS. G. STEVENS.

Upper Wimpole-street, W., Nov. 8th, 1931.

*** We have submitted this letter to our reviewer, who reiterates his opinion that squamous epithelioma is one of the rarest forms of cervical cancer.—ED. L.

## READING OF BRAILLE BY SIGHT.

*To the Editor of* THE LANCET.

SIR,—Very few sighted people, if any, read Braille by touch alone, there being no necessity on their part to concentrate to this attainment, but the deciphering of Braille, whether the embossing be linear, interlinear, or interpointal, is very trying to the normal reader, and must cause fatigue, conscious or unconscious, even in those accustomed to the work. Conservation of sight is, or should be, a primary consideration, and I have come to the conclusion that for sighted teachers in schools for the blind, who are constantly reading and correcting Braille productions of students, as well as for those who read Braille journals and magazines, the following method may prove of great benefit: Over the Braille embossed page spread a sheet of pencil or soft typewriting carbon-paper and gently press with the fingers and palm of the hand so that the dark pigment may colour the tops of the prominences, causing the bosses to stand out distinctly, thereby making deciphering easier and thus relieving eyestrain. Other methods may, of course, be adopted, such as brushing gently with the carbon and pressing it over the bosses; or a stick of charcoal can be rubbed over a Braille page, the surplus dust being flicked off with a light duster, when it will be found that a certain amount of deposit will remain adherent to the bosses as the fibres of the paper have been disturbed; but in my opinion this last method is not so good or effective as the carbon-paper.

The above suggestions may also be of value to readers who are unfortunately losing their sight.

I am, Sir, yours faithfully,
FREDK. WM. ALEXANDER.

Teddington, Middlesex, Nov. 4th, 1931.

## MASSIVE COLLAPSE OF THE LUNG.

*To the Editor of* THE LANCET.

SIR—The very interesting case recorded by Dr. T. E. Gumpert and Dr. T. MacLennan in your issue of Nov. 7th (p. 1017) might, I think, be explained in a manner different to that put forward by the authors. The injury to the fifth and sixth ribs could readily produce a lesion of the pleura associated with hæmorrhage. As is well known, blood in the pleura does not clot immediately. The absorption of serum would account for the pyrexia as occurs in most cases of surgical operation, and the production of fibrin would cause pleural irritation with pain on deep inspiration and irritable cough. The sudden onset may occur in any form of pleurisy. A small area of pleurisy near the middle line front or back can originate serious and sudden symptoms and may be difficult to detect. The defective movement of the left chest and impaired note and breath sounds are conditions produced by fixation through tonic muscular action, a phenomenon constant with acute pleural irritation. I have found no evidence that it occurs with a clear cut and pure intra-pulmonary condition. The other signs I have explained in a letter to you (Oct. 24th, p. 934). The subsequent course of this case is the usual one in such cases of massive collapse attack.

The authors attribute the condition to implication of the sympathetic chain in the neighbourhood of a damaged left crus, upsetting the balance between sympathetic and vagus innervation of the lungs. It is difficult to see what precise form of injury would stimulate for an isolated period of about 24 hours the nerve fibres in the sympathetic chain, or why such stimulation if it could occur should cease suddenly or should affect the left lung only to the exclusion of other parts, such as the right lung or the heart. Removal of one sympathetic chain in experimental animals does not lead to one sided massive collapse as one would expect if this theory were sufficient to account for all the symptoms.

This isolated and sudden change in the balance of sympathetic and vagus action is the basis of the theory of Woodburn Morrison adopted by the present authors. It does not explain the pain and I doubt if it accounts for the pyrexia and suddenness of the

onset. It takes no account of the state of the chest wall nor of the frequent finding of pleurisy. It is a fascinating theory and attempts to bring in new facts to explain a puzzle.

I must reassert the fact that with quet and unconscious breathing the diaphragm, especially the muscular portion, is elevated cephalicwards when the supine or reclining posture is assumed from the upright. I shall be pleased to show any unbelievers the methods employed and the tracings obtained in my investigations.

I am, Sir, yours faithfully,

CHARLTON BRISCOE.

Harley-street, W., Nov. 10th, 1931.

### MEDICAL WORK IN THE SERVICES.

*To the Editor of* THE LANCET.

SIR,—Having regard to the apparent unreadiness of medical men to embrace a life in the medical branches of the fighting services, it may be of interest to consider the following observations.

The first is taken from the *Bache Review*, New York, of May 16th, and is quoted by Prof. William McDougall on p. 94 of "World Chaos" (London, 1931). Although the passage refers to artisans it is also applicable to many medical men whose work is their sole means of livelihood. "It is confidently believed that if fear of lack of work were removed from the mind of the working man, he would approach his work with an entirely different attitude, his intelligence would be aroused, his interest stimulated, and he would have enthusiasm and satisfaction from the work to be done."

The second observation is taken from your report of Dr. R. M. Beath's oration at the Royal Victoria Hospital, Belfast (THE LANCET, Oct. 31st, p. 989). Dr. Beath is reported as saying that the complete doctor needs three things in addition to his medical learning. These are: (1) association with his fellows and more especially those engaged in different work from himself; (2) reading of general literature; and (3) travel. He should "see as much as possible of other countries, different scenery, different modes of life, habits, and customs, different art and architecture, and also of medical work in other places."

In the medical services referred to the conditions required in the foregoing passages are fulfilled. It is surprising that they are not more widely appreciated. I enclose my card, and am, Sir,

Yours faithfully,

Nov. 9th, 1931. READER.

# PANEL AND CONTRACT PRACTICE

### INCREASED CERTIFICATION IN IRELAND.

AN important circular has been issued by the National Health Insurance Commission of the Irish Free State to all medical certifiers, dealing with what is termed "undue increase in the number of medical certificates issued." The word "undue" seems to beg the question, since no evidence is given to show that certificates are issued more readily than at any previous time, and it is understood that the increase in payments for sickness benefit in the Irish Free State is not greater proportionally than in Great Britain. The circular states that the number of medical certificates issued has increased by 77 per cent. between 1923 and 1930, the actual figures being 709,262 and 1,253,224. During the same period the amount expended by approved societies on sickness and disablement benefits has grown by 74 per cent. from £354,828 to £617,699. The matter has recently been considered by a subcommittee of the advisory committee, consisting of representatives of the medical profession and the approved societies, and as a result of their report the Commission desire to impress on medical certifiers certain urgent and important points, which are stated as follows:—

"(*a*) If you issue a medical certificate of incapacity to a person who is not incapable of work you are placing a burden on the National Health Insurance Fund which it was not designed to bear; for which no provision was made in the contributions; and which, if continued, must lead to financial instability.

"(*b*) Before issuing a certificate of incapacity you should conscientiously examine every person who applies for a medical certificate. If he is unable to visit you, it is your duty to visit and examine him.

"(*c*) If you are satisfied that he is incapable of work, owing to some specific disease or to bodily or mental disablement, you should issue a certificate.

"(*d*) A certificate of incapacity should be based solely on your honest opinion as to the state of the applicant's health as disclosed by your examination. A certificate should not be issued on sympathetic grounds—e.g., unemployment or poverty.

"(*e*) If you are satisfied that he is *not* incapable of work *you should without hesitation refuse to issue a certificate and notify the Commission on Form M.C.6.*

(A record of the number of these Forms received from you each quarter will be kept, and if you are issuing a large number of certificates and sending few or no notification of refusals, special investigation will be made.)

"(*f*) If you are in doubt as to whether the applicant is capable or incapable of work, you should, in addition to issuing or refusing to issue a certificate, apply immediately on Form D.M.4 for a second opinion under the District Medical Referee Scheme.

"(*g*) If you find that an applicant, who has been incapable of work and to whom you have been issuing certificates, is fit for work or will be fit in not more than three days, issue a *final* certificate to that effect at once.

"(*h*) Do not issue a certificate to any person other than the insured person to whom it applies. Issue to a third party often leads to fraud."

The Commission add that in future the maximum monetary penalty to which certifiers will be liable for breaches of their agreement will be raised from £5 to £20, and that cases of serious irregularity shall be reported to the Medical Registration Council. They appeal for the coöperation of every medical certifier, and add that in case of proven irregularity in future the Commission will deal drastically with the certifier concerned.

### REFERENCE TO R.M.O.'S.

Dr. F. K. Tomlinson (Godalming) writes: In your issue of Oct. 3rd (p. 771) "Rural Panel" exposed the real cause of excessive certification. I should like to draw attention to an obvious case of indiscriminate referring by an approved society.

A girl, aged 20, saw two doctors in a nearby town on Oct. 3rd, 1930. On Oct. 9th she came to my surgery, stating that as they had advised her to rest she had come to stay with her only relative here. On Oct. 10th I visited and examined. Heart and lungs nil. Abdomen nil. Pulse 78. Blood pressure 130/60. Hb index 75. History of menorrhagia with clots. Always lost a lot of blood after tooth extractions. Urine nil. Next menstrual period Oct. 22nd. Was very pale. I certified menorrhagia, and put her on calcium lactate and a diet with high Fe-content. On Oct. 15th I received a form for the R.M.O. The girl informed me that no visitor had been near. Her society is not a local one.

In my reply to the R.M.O. I stated that no proof of any improvement could occur before her next menstrual period. Surely Rural Panel's suggestion that we, and not the societies, should be allowed to refer cases would obviate such useless procedure after a single week's sickness or investigation.

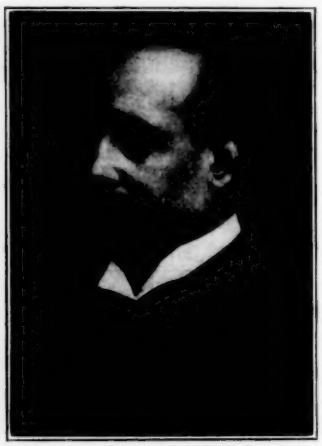
# OBITUARY

## BILTON POLLARD, M.D., B.S.Lond., F.R.C.S.Eng.,

CONSULTING SURGEON, UNIVERSITY COLLEGE HOSPITAL.

WE regret to announce the death of Mr. Bilton Pollard, Emeritus Professor of Clinical Surgery at University College, London, which occurred on Thursday, Nov. 5th, at his residence in Bournemouth a few days before his 76th birthday.

Bilton Pollard was the youngest son of a medical man, Mr. Tempest Pollard, of Rastrick, Yorkshire, and was born in November, 1855. He received his general education at St. Peter's School, York, and Epsom College and entered University College, London, in 1874. Joining the medical school he qualified as M.R.C.S. in 1879, and graduated M.B., B.S. in the University of London in the following year. He was a distinguished student throughout, being Filliter exhibitioner and Bruce medallist, while at his final examinations for the M.B. he obtained first-class honours. He took the F.R.C.S. Eng. in 1881, and held a series of junior appointments at University College Hospital as house officer, demonstrator of anatomy, and assistant to the professor of clinical surgery. In 1882 he took the valuable appointment of resident surgeon at the Royal Infirmary, Manchester, which he held for two years, when he returned to U.C.H. as surgical registrar. In 1886 he was elected surgeon to the North-Eastern Hospital for Children, Bethnal Green (renamed "Queen's" in 1908), with which institution he remained connected until his death, as surgeon and consulting surgeon. In 1887 he became assistant surgeon to University College Hospital, where the surgical staff comprised, among others, Christopher Heath, Marcus Beck, Rickman Godlee, and Victor Horsley, who was his immediate senior; seven years later he succeeded to the full surgeoncy which he filled for exactly 20 years. During his long connexion with the hospital he won high opinions among his colleagues alike for his skill and his prudence, while among the students he was recognised from the commencement of his work at the school as a valuable teacher. It is not surprising therefore that he should have been in demand as an examiner, his services in this way being called upon in the Universities of Oxford and Manchester, while he was a member of the Court of Examiners of the Royal College of Surgeons of England for a prolonged period. In 1896 Pollard was elected professor of clinical surgery at University College, becoming emeritus professor in 1915, and from 1910 to 1918 he was a member of the Council of the Royal College of Surgeons.



MR. BILTON POLLARD.

[*Photograph by Elliott & Fry.*

Bilton Pollard's medical writings were all strictly surgical, and founded upon his own clinical experience. They are to be found in the Surgical Reports of his hospital, in the transactions of the old Royal Medical and Chirurgical and Pathological Societies, in our own columns, and in those of the *British Medical Journal*, and in Heath's Dictionary of Surgery to which he was a valuable contributor. The most part of this work was done in the earlier days of his career, and the procedures recorded prove him to have been an advanced and scientific operator, who rightly earned the reputation which he enjoyed with his professional colleagues and the public. He edited a steady series of editions of "Heath's Minor Surgery," a popular little text-book, which he made practically useful for many years. In 1915 he was elected consulting surgeon to the hospital, and shortly afterwards he retired from practice. He never married.

Dr. Herbert Spencer writes: "Sad and sorrowing at the loss of my oldest and dearest friend, Bilton Pollard, I send you a few lines concerning him. In my opinion he was the best all-round surgeon and one of the best men I have ever met. A fine anatomist, an able teacher, a loyal colleague, skilful, careful, thorough, and kind, 'Bilton' enjoyed the trust and confidence of colleagues, pupils, and patients alike. With great experience he combined skill and sound judgment and an uncommon amount of common sense. His hands, like Lawson Tait's, were chubby; but oh! how skilful! As an operator he was slow; but oh! how careful! He inculcated by his example and by his success the value of exact suturing in surgery, demonstrating that the greater the difficulty the greater was the need for the care and exactness which need time. I have seen him take nearly four hours to remove the cancerous colon, together with the kidney involved. The patient made a simple recovery and remained well for many years. In another case of cancer of the colon, which had been refused operation by a well-known surgeon, Pollard operated and for more than 20 years afterwards he was gratified by receiving a card from the patient on the anniversaries of the operation. His hare-lip operations were beautiful examples of his plastic work. He early acquired a great experience of practical surgery at Manchester, while his surgical reports at University College Hospital, which contain a description of each case, with microscopical examinations carried out by himself, have, I think, never been surpassed. They are a lasting monument to the thoroughness of his hospital work, as are his case-books of patients in the wards. Pollard had a large private practice up to the time of his retirement from ill-health; but his publications, accurate and lucid like all he did, were comparatively few. For his surgical skill he will be mourned by many; for his goodness by his most intimate friends."

Mr. Raymond Johnson writes: "The death of Bilton Pollard removes one to whom all University College Hospital men, who came under his influence and the many others, who in one way or another were associated with him, will look back with unmixed feelings of affection and respect. It is no mere figure of speech to say that Pollard was a man of sterling worth, absolutely free from any suspicion of show or insincerity and very intolerant of such in others. He always seemed to me to be incapable of a mean or unkind action, but he could be quietly very outspoken when he felt strongly on any subject. As a surgeon Pollard's judgment was extraordinarily

(*Continued at foot of next page.*)

# MEDICAL NEWS

## University of Cambridge.

On Nov. 7th the following degrees were conferred :—

*M.B. and B.Chir.*—R. B. Mayfield, G. H. G. Southwell-Sander, and W. H. Poole.
*M.B.*—W. J. Wilkin.
*B.Chir.*—Douglas Divine.

## English Conjoint Examining Board.

At the final examination, held from Oct. 12th to Nov. 2nd, the following candidates were approved in the subjects indicated below, but are not yet eligible for diplomas :—

*Medicine.*—T. Abdel Rahman, Royal Free; H. Barcroft, Camb. and St. Mary's; H. J. Beard, Manchester; F. H. E. Beckett, Guy's; M. Blashka, Charing Cross; S. B. Bromberg, St. Mary's; R. C. Brown, St. Thomas's; F. E. Buckland, Oxford and St. George's; M. Chalkowski, St. George's; D. C. De Wet, St. Thomas's; Fanny C. Fraser, Royal Free; D. C. Green, St. Thomas's; L. E. Green, St. Bart.'s; M. A. F. A. Hadi, Birmingham; C. F. Hamilton-Turner, Oxford and St. George's; Anne E. M. Herbert, King's Coll.; O. S. Heyns, Univ. Coll.; A. Kennedy, St. Thomas's; L. W. Lauste, St. Thomas's; Mary A. McKean, Royal Free; G. Maizels, Manchester; K. Malik, L.D.S. Eng., London; Irene P. Murray, King's Coll.; R. S. Ogborn, Univ. Coll.; R. H. Patel, Birmingham; E. D. Portman, Manchester; E. R. B. Reynolds St. Thomas's; A. J. Sanghani, M.B. Bombay, West London; S. B. H. Saunders, and O. A. Savage, St. Bart.'s; J. A. E. Scott, Oxford and Middlesex; W. Garraway Smith, L.D.S. Eng., Cardiff; Joan W. Stelfox, Liverpool; J. R. Strong, St. Bart.'s; S. K. K. Sze, Camb. and St. Thomas's; G. H. Taylor, Guy's; Greta Traub, King's Coll.; J. H. West, St. Bart.'s; J. I. Wilson, Univ. Coll.; and F. H. Wood, Birmingham.

*Surgery.*—H. C. Bamford, St. Bart.'s; W. C. Barber, Camb. and Manchester; G. N. Barker, St. Thomas's; C. H. Bateman, St. Bart.'s; J. H. B. Beal, Oxford and St. Bart.'s; F. H. E. Beckett, Guy's; H. L. Beckitt, London; Mavis W. M. Beddall, Univ. Coll.; J. G. Billington, St. Thomas's; Jane Bonnell, Wales and King's Coll.; H. T. L. Broadway, St. Thomas's; R. H. P. Clark, London; G. H. Cooray, Ceylon and Univ. Coll.; E. H. de B. Crowther-Smith, Guy's; J. F. Dales, Univ. Coll.; P. H. Daly, St. Mary's; T. A. L. Davies, St. Thomas's; G. E. Dunkerley, Univ. Coll.; R. M. Ebeid, St. Thomas's; H. Edwards, Guy's; R. T. Elven, Guy's; J. Fishman, London; H. R. Fosbery, L.M.S.S.A., Middlesex; L. Freeman, St. Bart.'s; A. M. Gill, Middlesex; F. J. S. Gowar, Middlesex; R. D. Green, London; J. N. Groves, Camb. and St. Bart.'s; K. W. Hardy, London; Helen A. Hatrick, Univ. Coll.; F. R. Hayward, Guy's; K. H. C. Hester, London; W. N. Hine, Middlesex; A. Hollinrake, St. Bart.'s; A. Hollingsworth, St. Thomas's; M. S. Holzman, London; J. Hughes, M.P.S., Bristol; W. A. Hyslop, London; W. L. James, Guy's; E. T. Jones, Wales and London; G. W. Kendrick, St. Thomas's; W. S. G. Lawson, St. Thomas's; Gladys A. R. Lenanton, Royal Free; J. T. R. Lewis, Middlesex; W. H. Lewis, Camb. and Guy's; I. A. MacDougall, Guy's; S. A. MacKeith, St. Mary's; N. F. Maclagan, Middlesex; M. N. Mahmood, M.B. Punjab, Middlesex; J. I. Maran, Univ. Coll.; R. G. Mayall, Camb. and St. George's; G. J. Meikle, Camb. and Middlesex; B. C. Murless, Camb. and St. Bart.'s; G. Y. Oon, Charing Cross; A. H. Osmond, Birmingham; R. Parkinson, London; J. C. Pedley, Middlesex; Norah W. K. Petter, Royal Free; C. R. D. Porter, Middlesex; T. W. H. Porter, Middlesex; K. C. Priddy, London; F. Radcliffe, Camb. and St. Bart.'s; A. E. G. Ridgway, London; P. G. Roberts, St. Bart.'s; M. Rooms, Leeds; H. Rosenberg, Guy's; H. W. Salmon, Middlesex; J. R. S. Sharp, Guy's; R. F. Simkin, St. Mary's; R. E. H. Simpson, St. Thomas's; K. H. Singh, M.B. Bombay, King's Coll.; R. H. Smith, Camb. and St. Thomas's; M. G. Stratford, Univ. Coll.; O. S. Tubbs, St. Bart.'s; W. Wilson, Camb. and St. Bart.'s; and H. T. S. Wise, King's Coll.

*Midwifery.*—H. Agar, Leeds; S. D. Ahuja, M.B. Punjab Charing Cross; R. M. Alford, St. Thomas's; J. C. G. Anderton, Camb. and Westminster; F. C. Angior, Liverpool; Mary Aquino, M.B. Bombay; Monica H. Austin, King's Coll.; W. C. Barber, Camb. and Manchester; C. G. Barnes, St. Mary's; J. Bayley, St. Thomas's; J. H. B. Beal, Oxford and St. Bart.'s; H. J. Beard, Manchester; S. Begum, M.B. Punjab; G. T. Bevir, Bristol; J. R. Blackburne, St. Bart.'s; Jane Bonnell, King's Coll.; R. W. W. Bose, Camb. and London; J. A. Boycott, Oxford and Univ. Coll.; E. Braithwaite, Oxford and London; A. Brown, King's Coll.; J. Cann, Camb. and St. Thomas's; W. M. Capper, St. Bart.'s; A. Carling, Oxford and St. Thomas's; R. G. C. G. Carlson, Bristol; D. B. Cater, Camb. and Charing Cross; B. Cates, St. Bart.'s; I. A. Cathie, Guy's; J. R. Chambers, Camb. and Middlesex; S. J. Chesser, Camb. and St. Thomas's; R. H. P. Clark, London; B. Cohen, Middlesex; H. Cohen, Middlesex; Margaret J. Cooper, Royal Free; S. W. Cooper, St. Mary's; E. H. de B. Crowther-Smith, Guy's; P. H. Daly, St. Mary's; D. T. Davies, St. Bart.'s; Mary T. Day, Charing Cross; H. De, Calcutta and St. George's; G. C. T. Du Toit, St. Bart.'s; R. T. Elven, Guy's; G. M. Evans, Bristol; M. H. Evans, Oxford and Middlesex; A. L. Eyre-Brook, Bristol; H. F. M. Finzel, Bristol; E. C. Fountaine, Camb. and St. Bart.'s; A. E. Francis, St. Bart.'s; G. H. M. Franklin, Manchester; W. H. Gabb, Camb. and St. Bart.'s; A. H. Galley, King's Coll.; G. D. Galwankar, Bombay; T. A. Gavin, Guy's; D. W. C. Gawne, Camb. and St. Bart.'s; H. T. Giblin, St. Mary's; B. Gilbert St. Thomas's; R. G. Gilbert, St. Bart.'s; K. J. Gilchrist, Guy's; L. Greenfield, London; E. H. B. Grey, London; J. N. Groves, Camb. and St. Bart.'s; R. J. C. Hamilton, St. George's; Joan G. Harcourt, Royal Free; J. C. Hardy, Univ. Coll.; G. R. Hargreaves, Univ. Coll.; F. R. Hayward, Guy's; C. L. Heanley, Camb. and London; A. A. Heathcote, Camb. and St. Bart.'s; R. A. Hooper, Camb. and St. Thomas's; M. D. C. Hosford, St. Bart.'s; T. G. Hovenden, Oxford and St. Thomas's; A. C. Howard, Univ. Coll.; R. B. Hughes, Leeds; B. Haynes, Middlesex; A. D. Iliff, St. Bart.'s; D. H. Irish, Guy's; E. A. James and E. James, Leeds; K. C. Jeffery, London; W. B. Johnston, St. Mary's; C. G. Jones, Middlesex; T. B. Jones, Camb. and St. Thomas's; M. Katz, St. Bart.'s; K. D. Keele, St. Bart.'s; L. Kessel, Guy's; L. O'N. Knox, Guy's; R. Knox, Oxford and St. Bart.'s; A. R. R. Le Fleming, Camb. and St. Thomas's; A. W. D. Leishman, Oxford and St. Bart.'s; D. T. Lewis, Cardiff and St. Mary's; R. M. Littledale, Middlesex; M. B. McGinn, London; J. G. McGrath, Manchester; J. D. Macleod, St. Thomas's; M. N. Mahmood, M.B. Punjab, Middlesex; G. Maizels, Manchester; G. A. Mandow, Camb. and St. Bart.'s; R. G. Mayall, Camb. and St. George's; A. R. R. Mears, Camb. and St. Bart.'s; I. R. W. Merrick, King's Coll.; J. A. W. Miller, Guy's; T. D. F. Money, Camb. and St. Thomas's; C. C. Morgans, Camb. and St. Thomas's; B. C. Murless, Camb. and St. Bart.'s; W. Mushin, London; D. R. Narang, M.B. Punjab, London; W. T. North, Guy's; J. A. Nunn, St. Bart.'s; H. E. Offord, St. George's; Josie M. Oldfield, Royal Free; C. V. Oldroyd, Manchester; H. Owen, Oxford and St. Mary's; G. B. Palmer, L.D.S. Eng., Guy's; J. Parkes, Camb. and St. Thomas's; R. Parkinson, London; R. E. J. Pembrey, St. Thomas's; O. R. L. L. Plunkett, St. George's; C. B. R. Pollock, Guy's; C. G. Post, Guy's; E. C. Powell, Cardiff and Guy's; F. J. P. Price, King's Coll.; Pushpawati, Punjab and Royal Free; A. Rashid, Lahore; J. C. Read, L.D.S. Eng., Guy's; L. Redhouse, Middlesex; H. G. Rees, Middlesex; R. G. Reid, Guy's; J. P. Reidy, London; A. E. A. Ridgway, A.M.I.M.E., Charing Cross; H. J. M. Robinson, Camb. and St. George's; A. Rothwell, Camb. and King's Coll.; C. N. Royal, Bristol; A. C. Rumsey, Camb. and London; R. H. Rushton, King's Coll.; T. J. Ryan, St. Bart.'s; Frances N. Salisbury, Bristol; A. W. Sampey, London; O. E. L. Sampson, Bristol; A. J. Sanghani, M.B. Bombay, West London; G. C. Sawyer, Guy's; B. H. Sayed, St. George's; J. L. S. Scott, St. Bart.'s; E. F. Scowen, St. Bart.'s; V. M. Seifert, London; J. C. Selnes, Oslo and Charing Cross; B. Shanovitch, London; F. J. Sladen, Middlesex; W. Garraway Smith, L.D.S. Eng., Cardiff; W. H. C. Spooner, St. Mary's; J. E. Stephens, St Thomas's; M. Sternberg, Middlesex; R. Stevenson, Camb. and St Thomas's; M. G. Stratford, Univ. Coll.; W. T. Swanton, L.M.S.S.A. Lond., Cork and Charing Cross; E. H. Thierry, Univ. Coll.; C. W. Thomas, Camb. and St. Thomas's; J. T. Turner, Camb. and St. Thomas's; C. M. Vaillant, Oxford and Liverpool; H. B. D. Vaughan, St. Bart.'s; O. J. Vaughan-Jackson, Oxford and London; D. P. Viljoen, St. Bart.'s; A. A. M. Wajih, Bengal and Charing Cross; Celia Weinstein, Royal Free; H. A. T. Wells, Madras and Guy's; R. A. L. Wenger, Camb. and St. Bart.'s; E. E. S. Wheatley, St. Thomas's; H. D. White, Camb. and St. Bart.'s; R. H. H. Williams, Camb. and St. Bart.'s; L. J. Wolfson, Guy's; T. G. R. Woods, St. Bart.'s; S. W. Wright, Guy's; and K. E. L. Yuill, Birmingham.

*Pathology.*—A. L. Abeyewardene, Ceylon and Univ. Coll.; J. C. G. Anderton, Westminster; C. G. Baker, L.D.S. Eng., Guy's; C. G. Barnes, St. Mary's; G. T. Bevir, Bristol; T. P. Binns, Guy's; H. W. Boake, Camb. and St. Thomas's; C. P. F. Boulden, London; E. Braithwaite, Oxford and London; A. E. Burjony Durham; J. D. Burrows, St. Thomas's; D. B. Cater, Camb. and Charing Cross; I. A. Cathie, Guy's; M. Chalkowski, St. George's; J. R. Chambers, Camb. and Middlesex; J. G. R. Clarke, St. Thomas's; J. C. Colbeck, Guy's; T. A. Connold, St. Thomas's; N. C. Coombs, Bristol; H. G. N. Cooper, Oxford and Guy's; D. R. Crabb, St. Bart.'s; G. W. Crimmin, Camb. and St. Thomas's; C. F. Cumings, King's Coll.; F. J. Curtis, Camb. and Guy's; A. M. Davies, Bristol; L. S. De Silva, King's Coll.; J. F. H. Eagles, Bristol; W. G. Evans, Camb. and St. Mary's; W. J. M. Evans, Cardiff; A. L. Eyre-Brook, Bristol; K. Fawssett, St. Thomas's; H. F. M. Finzel, Bristol; L. P. Fitch, St. Thomas's; F. E. Fletcher, Bristol; A. E. Francis, St. Bart.'s; D. W. C. Gawne, Camb. and

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(*Continued from previous page.*)

sound and his opinion most valuable. His operating was free from any attempt at display; it was carried out with a deliberation, which was apt to be mistaken for slowness, and, when occasion required, could be carried to very courageous lengths. The best proof of the esteem in which Pollard was held by his professional brethren is afforded by the large numbers of them who came to him for the surgical treatment of themselves and their families. I well remember how, many years ago, in conversation among certain junior members of the staff, the question arose as to whom we should choose in advance to treat us for any medical or surgical ailment which might at any time befall us and the unanimous choice was Bilton Pollard. Had he been asked to whom he was most indebted in his surgical career I am quite sure his answer would have been Marcus Beck."

St. Bart.'s; G. H. Gibbens, St. Thomas's; B. Gilbert, St. Thomas's; R. G. Gilbert, St. Bart.'s; P. A. I. Gorer, Guy's; C. H. Gray, Manchester; D. C. Green, St. Thomas's; E. H. B. Grey, London; N. C. Griffin, Leeds; J. Halperin, St. Bart.'s; G. R. Hargreaves, Univ. Coll.; Anne E. M. Herbert, King's Coll.; E. A. Hoare, St. Thomas's; L. P. Hodgson, Birmingham; H. V. D. Iles, Guy's; E. James, Leeds; K. C. Jeffery, London; W. B. Johnston, St. Mary's; R. A. Jones, Camb. and London; S. O. Jones, King's Coll.; W. S. G. Lawson, St. Thomas's; Z. Lefkovitz, Cardiff; S. Livni, London; M. J. F. McArdle, Guy's; G. A. Mandow, Camb. and St. Bart.'s; Gwendolen E. Matthews, Westminster; A. R. R. Mears, Camb. and St. Bart.'s; G. A. Miller, Camb. and Guy's; T. D. F. Money, Camb. and St. Thomas's; W. H. W. Morris, St. Thomas's; W. Mushin, London; J. W. M. Owen, St. Mary's; J. Parkes, Camb. and St. Thomas's; R. E. J. Pembrey, St. Thomas's; G. C. Post, Guy's; E. C. Powell, Guy's; G. A. Powell-Tuck, Birmingham; R. Raines, Leeds; L. Redhouse, Middlesex; A. E. A. Ridgway, Charing Cross; H. Rosenberg, Guy's; Frances N. Salisbury, Bristol; O. E. L. Sampson, Bristol; M. H. P. Sayers, St. Thomas's; R. F. Simkin, St. Mary's; E. R. Sinton, Birmingham; S. F. Smith, St. Thomas's; S. B. Smith, Guy's; E. J. Somerset, King's Coll.; W. H. C. Spooner, St. Mary's; F. Summers, King's Coll.; Barbara M. G. Taylor, Leeds; N. S. Taylor, King's Coll.; Enid A. Taylour, Bristol; A. E. Terry, Leeds; D. H. H. Thomas, Westminster; G. L. Timms, St. Thomas's; J. B. L. Tombleson, St. Thomas's; Greta Traub, King's Coll.; O. S. Tubbs, St. Bart.'s; O. J. Vaughan-Jackson, Oxford and London; D. P. Viljoen, St. Bart.'s; E. J. Walsham, St. Thomas's; and W. Wilson, Camb. and St. Bart.'s.

## Society of Apothecaries of London.

In future a separate examination in pathology and bacteriology (written, practical, and oral) will form section I. of the final examination for the diploma of L.M.S.S.A. Candidates must take this section not later than the last part of section II. of the final examination, and will be admissible to it not less than 24 months after passing in anatomy and physiology, on production of the certificates laid down. This Regulation will not apply to candidates who pass, or become entitled to exemption from, the primary examination in anatomy and physiology before Jan. 31st, 1932. Candidates who begin their professional studies after Jan. 1st, 1932, will be required to complete the whole of section II. of the final examination (medicine, surgery, midwifery, and forensic medicine) within a period not exceeding 25 months. In cases where the period has been exceeded, it will be necessary for candidates to pass again in any subject or subjects in which they may have already satisfied the examiners, until this regulation is complied with.

## Royal College of Surgeons of England.

The annual meeting of Fellows and Members will be held at the College in Lincoln's Inn Fields on Nov. 19th at 3 P.M. A resolution suggesting the representation of Members on the College Council will be moved by Sir Ernest Graham-Little, M.P.

## Royal College of Physicians of Edinburgh.

A quarterly meeting of the College was held on Nov. 3rd with Sir Norman Walker, the President, in the chair. Dr. Thomas Douglas Inch (Gorebridge) and Dr. Edward Robert Charles Walker (Aberdeen) were introduced and took their seats as Fellows of the College. Dr. James Douglas Allan Gray (Liverpool), Dr. John Gibb McCrie (Edinburgh), and Dr. Douglas Nairn Nicholson (Edinburgh) were elected to the Fellowship.

The Hill Pattison-Struthers bursary in anatomy and physiology was awarded to Norman Macdonald. The Wood bursary was awarded to Alastair William Wright. A Certificate of Qualification to Lecture was conferred upon Dr. Donald Stewart.

At an extraordinary meeting held after the quarterly meeting, it was decided to offer the honorary Fellowship of the College to Mr. John Wheeler Dowden, president of the Royal College of Surgeons of Edinburgh.

## Royal Faculty of Physicians and Surgeons of Glasgow.

The following office-bearers have been elected for the ensuing year: President, Mr. R. Barclay Ness; Visitor, Dr. J. M. Munro Kerr; Hon. Treasurer, Mr. J. H. MacDonald; Hon. Librarian, Dr. E. H. L. Oliphant; Representative to the General Medical Council, Mr. G. H. Edington; Councillors (in addition to the above), Mr. Andrew Allison, Dr. Carstairs C. Douglas, Dr. John F. Fergus, Mr. John Gracie, Dr. John Henderson, Mr. W. Dove Macfarlane, Dr. J. Souttar McKendrick, Mr. W. Ferguson Mackenzie, Mr. W. J. Richard, and Mr. Archibald Young.

In demitting office the retiring president, Dr. John F. Fergus, gave a donation to the benevolent fund of the faculty. He also presented a silver inkstand—a replica of that in the House of Commons—on which the arms of the Faculty are engraved with the inscription: "To the Faculty, beloved and held in honour by Andrew Fergus, President, 1874–77 and 1883–1886; A. Freeland Fergus, President, 1918–1921; John F. Fergus, President, 1929–1931, from J.F.F. 1931."

## Yorkshire Aberdeen Graduates Association.

The annual dinner of this association will be held at the Midland Hotel, Bradford, on Friday, Nov. 20th. The chief guest will be Lieut.-Colonel David Rorie. Aberdeen graduates of either sex are welcome, and should communicate with the hon. secretary: Dr. J. G. Thomson, 33, Vernon-road, Leeds.

## Model Abattoir Society.

Sir James Crichton-Browne will preside at the tenth annual Benjamin Ward Richardson lecture, which will be given on Wednesday, Nov. 25th, at 5 P.M., at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1, by Mr. Hal Williams, M.I.Mech.E. His subject will be Disease and the Public Abattoir.

## British Empire Cancer Campaign.

Sir Charles Gordon-Watson presided at the quarterly meeting of the Grand Council of the campaign on Nov. 10th. The Council made further grants for one year of £600 to the cancer research committee of the Marie Curie Hospital, £300 to Mrs. E. K. Dawson, of Edinburgh, and £50 to Mr. E. Nevill Willmer, of Cambridge.

Sir Charles Gordon-Watson, as chairman of the investigation committee, reported in detail the whole of the investigations which had been made by the campaign in connexion with the diagnostic claims of Dr. Bendien, of Zeist, Holland. He pointed out that Dr. Bendien had never made claims concerning the treatment of cancer.

A vote of grateful thanks was accorded by the Council to Sir William Morris for having given £25,000 to the campaign for the establishment of a radiological research fellowship at Mount Vernon Hospital. The work to be carried out under the fellowship will be both of a clinical and laboratory nature.

## Society of Medical Officers of Health.

By invitation of Sir Ernest Debenham the metropolitan branch of this society visited Bladen Dairies, at Milborne St. Andrew, Blandford, Dorset, on Nov. 5th. The dairy, which is capable of handling some 20,000 gallons a day, collects milk from about 90 farms in the neighbourhood, pasteurises it by the holding method, and dispatches it in cartons to London, Bournemouth, and other centres. A glass bottle containing half a pint of milk weighs about 22½ oz., whereas a carton with the same content weighs only 11 oz. The weight of the bottle and the carton are respectively about 12¼ oz. and ¾ oz. The approximate price of a carton holding a pint is ½*d.*, and it is believed that, allowing for breakages and washing, the daily cost of glass bottles is about as much. Small cartons containing one-third of a pint, and intended for school-children, are obtainable for 1*d.* The milk is sold in London through grocers and other shops. The incidence of breakages is stated to be about ½ per cent.

Sir Ernest Debenham said that he started farming 18 years ago with a bias towards providing clean milk. He had maintained tubercle-free herds all the time, except during the war, but was "a little disillusioned" about certified milk. Whatever was done there were always one or two reactors in the herd, and with the greatest possible cleanliness the consumer was not protected against possible non-tuberculous infections of cow or cowman. Having failed to find distributors who would sell his certified milk at 8*d.* a quart in summer and 9*d.* in winter, he started supplying Grade A milk to Bournemouth and Dorchester in bottles. But these were too expensive to send by rail, and though they could be sterilised he was doubtful whether they could be effectively cleaned. A representative was sent to America to study the cartons, and they were adopted. Dr. G. Clark Trotter, president of the branch, said he believed that "wrapped milk" had come to stay. He hoped that the Government would help in the establishment of milk factories in clean country surroundings.

At Bladen Dairies the incoming milk is frequently examined by the reductase fermentation test, and on this test and the state of the curd, marks are awarded to the farmers. The first 12 each month get ½*d.* a gallon extra for their milk, and the second 12 get ¼*d.* Samples are taken from the milk as it leaves the dairy, and also samples of the milk which first passes through the plant in the morning. The pipes and containers are washed and then sterilised by steam for 20 minutes before and after work. Besides milk, Bladen Dairies produce Cheddar cheese, and are endeavouring to find adequate markets for dried whey which they prepare in a partial vacuum at low temperatures. The chief by-product of cheese-making is lactose, and Sir Ernest Debenham expressed regret that the medical profession did not recommend it more freely in artificial feeding. New Zealand, with a population of 2 millions, uses 250 tons a year, he said, whereas England, with 45 millions, consumes only 500 tons, half of which comes from Holland. Dried milk is also being made at Bladen Dairies on an experimental basis.

### Medico-Chirurgical Society of Edinburgh.

The following are the office-bearers of this society for the coming year. President: Mr. George L. Chiene. Vice-presidents: Dr. E. F. Armour, Dr. J. M. Bowie, and Dr. A. H. H. Sinclair. Councillors: Dr. F. K. Kerr, Dr. N. S. Carmichael, Dr. H. Maitland Moir, Mr. A. Pirie Watson, Dr. Lewis Thatcher, Dr. Douglas Guthrie, Dr. T. W. E. Ross, Dr. H. L. Watson Wemyss. Treasurer: Dr. John Orr. Secretaries: Mr. F. E. Jardine and Dr. W. A. Alexander. Editor of Transactions: Dr. Fergus Hewat.

### Royal Northern Hospital.

Post-graduate courses begin at the Royal Northern group of hospitals next Tuesday, Nov. 17th, when Dr. A Lisle Punch will speak on the Technique of Lipiodol Injections. Lectures and demonstrations will be given on Tuesday afternoons at 3.15 P.M., and from Jan. 18th to 22nd there will be an intensive course occupying morning and afternoon. All the lectures and demonstrations are open to practitioners without fee. Application should be made to the Dean, Dr. E. G. B. Calvert, at the Royal Northen Hospital, London, N. 7.

### Research in Mental Pathology.

An election to the Pinsent-Darwin studentship in mental pathology will be made next December. The studentship is of the annual value of not less than £200, and is tenable for three years. The student must engage in original research into any problem having a bearing on mental defects, diseases, or disorders, but may carry on educational or other work concurrently. Applications for appointment should be sent in proper form to the secretary, Pinsent-Darwin Studentship, Psychological Laboratory, Cambridge, before Dec. 5th.

# PARLIAMENT

## NOTES ON CURRENT TOPICS.

### OPENING OF PARLIAMENT.

ON Tuesday, Nov. 10th, the new Parliament was opened in State by the King, who was accompanied by the Queen, the Prince of Wales, the Duke of York, and the Duke of Gloucester.

His Majesty, in the course of the Gracious Speech from the Throne, said that the Government intended to pursue the policy of promoting peace and goodwill and to continue their active interest in the work of the League of Nations. Particularly they were giving close attention to the preparation for the approaching Disarmament Conference. The serious financial and economic situation of the world deeply concerned the Government. They would do their utmost in coöperation with other Governments, and in the spirit of mutual helpfulness, to find ways for restoring the volume of international trade. After expressing hopes for the success of the Indian Round Table Conference, and the Conference with representatives of Burma, the Gracious Speech went on to refer to a measure which is to be laid before Parliament to give statutory effect to the declarations and resolutions of the Imperial Conferences of 1926 and 1930. This measure is designed to make clear the powers of Dominion Parliaments and to promote the spirit of free coöperation amongst members of the British Commonwealth of Nations. The Government had received from the Government of Canada a proposal that the Economic Conference, which was adjourned in 1930, should be convened at Ottawa as soon as possible. This invitation had been welcomed by the Imperial Government and would be considered in the most sympathetic spirit and with an earnest desire to come to some mutually advantageous arrangement with the Governments of the Dominions. In a passage addressed to the Members of the House of Commons the Gracious Speech stated that the nation at the General Election had endorsed those measures for securing economy and balancing the national budget which constituted the first essential steps in the solution of the financial and economic problems with which the country had been confronted. The nation was also invited by the Government to empower them to pursue a policy designed fully to re-establish confidence in the financial stability of the country and to give them authority to frame plans for ensuring a favourable balance of trade. They further sought from the nation unfettered discretion to consider every proposal likely to be of assistance in these matters. The Government had now received a clear and emphatic mandate to that effect. The important problems involved were already under detailed examination by the Government. Decisions would be taken and applied with the least possible delay, and in due course any legislation that might be required would be submitted to Parliament.

Later in the day the Debate on the Address, thanking His Majesty for his Gracious Speech from the Throne, was opened in both Houses of Parliament. In the House of Commons the Address was moved by Mr. GEOFFREY LLOYD and seconded by Mr. FLINT. In the course of the debate in the Commons, Mr. RAMSAY MACDONALD, Prime Minister, in reply to Mr. LANSBURY, Leader of the Opposition, stated that the question of the Prolongation of Health Insurance Bill had not been overlooked by the new Government. He hoped that the Minister of Health would be in a position to make a statement on the subject at the end of the week.

The Address was moved in the House of Lords by the Earl of RADNOR and seconded by Viscount COWDRAY.

# Medical Diary

## SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

TUESDAY, Nov. 17th.—5.30 P.M., GENERAL MEETING OF FELLOWS. Ballot for election to the Fellowship. 8 P.M., PATHOLOGY.

THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 P.M.). Dr. W. K. Sibley: 1. Erythema perstans. Mr. H. D. Haldin-Davis: 2. Alopecia Areata in a Child of Nine Weeks. 3. Macular Atrophy of the Skin. Other cases will be shown. 8.30 P.M., NEUROLOGY. Discussion: The Innervation of the Bladder. Openers: Dr. J. R. Learmonth (Mayo Clinic), Dr. P. C. Cloake, Mr. F. J. F. Barrington. UROLOGY. Members of this Section are specially invited to attend.

FRIDAY.—5 P.M., PHYSICAL MEDICINE (Cases at 5.30 P.M.). Clinical meeting at the British Red Cross Society Clinic for Rheumatic Diseases, Peto-place, Marylebone-road, N.W. Mr. A. Woodmansey: Catalysis in Relation to Mineral Waters. Cases will be shown. 8.15 P.M., OBSTETRICS AND GYNÆCOLOGY. Short communication: Dr. Louisa Martindale: Recent Advances in Deep X ray Therapy in Gynæcological Conditions. Paper: Dr. Bethel Solomons: Obstetric Methods at the Rotunda Hospital in 1909 and 1929. 8.30 P.M., RADIOLOGY. Discussion: X ray Diagnosis of Diseases of the Chest. Opening papers: Dr. Stanley Melville: Tuberculous and Other Non-malignant Conditions. Dr. Peter Kerley: Malignant Conditions. Followed by Dr. F. G. Chandler, Dr. Maurice Davidson, Mr. Tudor Edwards, Dr. R. E. Roberts, Mr. J. B. Hunter, and others. MEDICINE. Members of this Section are specially invited to attend.

HARVEIAN SOCIETY.

THURSDAY, Nov. 19th.—8.30 P.M. (at 11, Chandos-street, W.), Prof. D. P. D. Wilkie: Surgery of the Spleen.

HUNTERIAN SOCIETY.

MONDAY, Nov. 16th.—9 P.M. (at the Apothecaries Hall, Water-lane, E.C.). Discussion on the Medical Aspects of Crime in Fact and Fiction. Dr. Norwood East, Dr. Edwin Smith, Mr. C. J. S. Thompson, and others will take part in the discussion.

CHELSEA CLINICAL SOCIETY, Hotel Rembrandt, Thurloe-place, S.W.

TUESDAY, Nov. 17th.—8.30 P.M., preceded by dinner at 7.30 P.M., Discussion on The Medicinal Uses of Wines. (To be opened by Mr. Charles Berry and Dr. G. Murray Levick.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

THURSDAY, Nov. 19th.—8.15 P.M. (at the Hospital for Tropical Diseases, Endsleigh-gardens), Clinical and Laboratory Meeting. The following amongst others with give Demonstrations: Drs. C. Russell Amies, H. A. Baylis, G. R. Mather Cordiner, N. Hamilton Fairley, Colonel Clayton Lane (for Prof. F. W. O'Connor), Drs. G. Carmichael Low, P. Manson-Bahr, and Sir Leonard Rogers.

ROYAL MICROSCOPICAL SOCIETY, B.M.A. House, Tavistock-square, W.C.

WEDNESDAY, Nov. 18th.—5 for 5.30 P.M., Mr. Conrad Beck: The Substage Diaphragm and its Functions. Dr. A. A. Tarkhan: Effect of Fixatives and other Reagents on Cell-size and Tissue-bulk.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Nov. 16th to SATURDAY, Nov. 21st.—CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. Special post-graduate Course in Diseases of the Chest. All-day.—LONDON LOCK HOSPITAL, Dean-street, W. Post-graduate course in Venereal Disease. Every afternoon. Fee £2 2s.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Broad-street, W.C. Post-graduate Course in Ophthalmology, Clinical instruction every afternoon 2.30 to 4.30 P.M. Special demonstrations on Mondays, Wednesdays, and Thursdays, at 5 P.M.—ROYAL WATERLOO HOSPITAL, Waterloo-road, S.E. All-day post-graduate Course in medicine, surgery, and gynæcology. Demonstrations and lectures.—MEDICAL SOCIETY OF LONDON, Chandos-street, Cavendish-square. Free lecture on Wed. at 4 P.M. on Glycosuria by Dr. Isaac Jones (deputising for Prof. H. MacLean).—In connexion with the M.R.C.P. evening lectures: on Monday, Nov. 16th, at 8.30 P.M., Dr. Roodhouse Gloyne: The Clinical Pathology of Tuberculosis, and on Wed., at 8.30 P.M., Dr. W. J. Adie: Diseases of the Nervous System (1).—KING'S COLLEGE HOSPITAL, Denmark-hill, S.E. Demonstration (free) by Dr. S. A. Kinnier Wilson in Out- and In-patient Departments at 2 P.M. on Tues.—ROYAL EYE HOSPITAL, St. George's-circus, S.E. Free demonstration by Mr. A. D. MacCallan of Clinical Cases at 4.15 P.M. on Thurs.—Further particulars from the Fellowship of Medicine.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Nov. 16th.—10 A.M., Gynæcological Wards; Genito-urinary Operations; Skin Department. 11 A.M., Surgical Wards. 2 P.M., Surgical Wards; Medical, Surgical, Eye, and Gynæcological Out-patients.
TUESDAY.—9.30 A.M., Operations. 10 A.M., Medical Ward Demonstration; Dental Department. 11 A.M., Throat Operations. 11.30 A.M., Surgical Demonstration. 2 P.M., Operations; Medical, Surgical, and Throat Out-patients.
WEDNESDAY.—10 A.M., Medical Wards; Children's Medical Out-patients. 2 P.M., Medical, Surgical, and Eye Out-patients. 2.30 P.M., Gynæcological Operations. 4.45 P.M., Venereal Diseases Demonstration.
THURSDAY.—10 A.M., Neurological Department. 11.30 A.M., Fracture Demonstration. 2 P.M., Medical, Surgical, Eye, and Genito-urinary Out-patients. 2.30 P.M., Operations.
FRIDAY.—10 A.M., Medical Wards, Skin Department, Dental Department. 2 P.M., Medical, Surgical, and Throat Out-patients. 2.30 P.M., Operations.
SATURDAY.—9 A.M., Throat Operations. 10 A.M., Medical Wards. Surgical Out-patients: Children's Medical Out-patients.

NATIONAL HOSPITAL, Queen-square, W.
MONDAY, Nov. 16th.—2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Cerebral Tumours (1).
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Critchley: The Parkinsonian Syndrome (1).
WEDNESDAY.—2 P.M., Dr. Martin: Out-patient Clinic.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Mr. Julian Taylor: Head Injuries (1).
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Collier: Nervous Complications of Blood Diseases.

UNIVERSITY COLLEGE, Gower-street, W.C.
TUESDAY, Nov. 17th.—3 P.M., Mr. W. Stephenson: Clinical Mental Tests.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Nov. 19th.—9 P.M., Sir John Thomson Walker: Stone in Kidney and Bladder.

ST. PAUL'S HOSPITAL, Endell-street, W.C.
WEDNESDAY, Nov. 18th.—4.30 P.M., Dr. R. H. J. Swan: Renal Tuberculosis.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
WEDNESDAY, Nov. 18th.—4 P.M., Mr. Edward D. Davis: Otitis Media.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, Nov. 17th.—3.15 P.M., Dr. A. Lisle Punch: The Technique of Lipiodol Injections.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Nov. 17th.—5 P.M., Dr. H. W. Barber: Bacteriology and Mycology.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Nov. 19th.—4.30 P.M., Mr. J. K. Hasler: Methods of Anæsthesia for Rectal Surgery.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, Nov 18th.—4 P.M., Mr. P. O'Connell Finigan: Oral Infection in Relation to General Disease.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Nov. 20th.—4 P.M., Mr. A. Ryland: Demonstration of Museum Specimens.

CHADWICK PUBLIC LECTURES.
WEDNESDAY, Nov. 18th.—5.15 P.M. (at 90, Buckingham Palace-road), Dr. G. Slot: Diet and Hygiene.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Nov. 18th.—4 P.M., Dr. Chalmers Watson: The Food of the Citizen.
THURSDAY.—4 P.M., Sir Arbuthnot Lane: The General Practitioner and Contraceptive Technique.

BRITISH INSTITUTE OF RADIOLOGY, Welbeck-street, W.
THURSDAY, Nov. 19th.—8.30 P.M., Dr. Ffrangcon Roberts: Some Criticisms of the International Protection Recommendations. Dr. G. E. Vilvandré: The Radiology of Gallstones and the Gall-bladder.
FRIDAY.—11 A.M., Visit to St. Peter's Hospital for Stone, Covent Garden, W.C.—5 P.M. (at the Institute), Cases. 5.30 P.M., Mr. David Levi and Dr. H. Courtney Gage: Gastrophotography (Demonstration).

UNIVERSITY OF SHEFFIELD.
FRIDAY, Nov. 20th.—3.30 P.M. (at the Royal Infirmary), Dr. R. Hallam: Some Common Skin Diseases.

MANCHESTER HOSPITAL FOR CONSUMPTION, Hardman-street, Deansgate.
WEDNESDAY, Nov. 18th.—4.30 P.M., Mr. E. S. B. Hamilton: Vertigo.

WESTERN INFIRMARY, Glasgow.
WEDNESDAY, Nov. 18th.—4.15 P.M., Mr. Logan Taylor: Surgical Cases.

THE FACULTY HALL, St. Vincent-street, Glasgow.
TUESDAY, Nov. 17th.—4 P.M., Prof. J. M. Munro-Kerr: Antenatal Care of the Expectant Mother.

MANCHESTER VICTORIA MEMORIAL JEWISH HOSPITAL, Elizabeth-street.
WEDNESDAY, Nov. 18th.—4.30 P.M., Mr. V. F. Lambert: The Treatment of Acute Inflammation of the Nasal Sinuses.

MANCHESTER ROYAL INFIRMARY.
TUESDAY, Nov. 17th.—4.15 P.M., Mr. J. P. Buckley: The Argument for and Against Gastro-Enterostomy.
FRIDAY.—4.15 P.M., Dr. E. B. Leech: Demonstration of Medical Cases.

UNIVERSITY OF LIVERPOOL.
THURSDAY, Nov. 19th.—4 P.M. (in the Medical School), Sir Robert Jones: Problems of the Stiff Joint (William Mitchell Banks Memorial Lecture).

ANCOATS HOSPITAL, Manchester.
THURSDAY, Nov. 19th.—11 A.M., Mr. F. H. Diggle: Clinical Demonstration. 4.15 P.M., Dr. N. Kletz: Affections of the Colon.

## INFECTIOUS DISEASE

### IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 31ST, 1931.

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 42 (last week 39); scarlet fever, 1831; diphtheria, 996; enteric fever, 30; pneumonia, 848; puerperal fever, 44; puerperal pyrexia, 94; cerebro-spinal fever, 12; acute poliomyelitis, 11; acute polio-encephalitis, 1; encephalitis lethargica, 7; dysentery, 16; ophthalmia neonatorum, 75. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Nov. 3rd–4th was as follows: Small-pox, 101 under treatment, 6 under observation (last week 78 and 4 respectively); scarlet fever, 1811; diphtheria, 1505; enteric fever, 15; measles, 197; whooping-cough, 376; puerperal fever, 16 (plus 11 babies); encephalitis lethargica, 220; poliomyelitis, 7; "other diseases," 158. At St. Margaret's Hospital there were 9 babies (plus 5 mothers) with ophthalmia neonatorum.

*Deaths.*—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 21 (2) from measles, 5 (1) from scarlet fever, 15 (4) from whooping-cough, 23 (5) from diphtheria, 66 (15) from diarrhœa and enteritis under two years, and 48 (4) from influenza. The figures in parentheses are those for London itself.

Stoke-on-Trent reported the only fatal case of enteric fever. Four deaths from measles were reported at the same town, 3 each at Bolton and Middlesbrough, 2 at Manchester. Liverpool and Manchester each reported 2 deaths from whooping-cough. Diphtheria claimed 3 victims at Liverpool and Hull, 2 at Stockport. Diarrhœa was credited with 6 deaths at Liverpool, 4 at Stoke-on-Trent, 3 each at Birmingham, Manchester, Leeds, and Hull.

The number of stillbirths notified during the week was 253 (corresponding to a rate of 40 per 1000 births), including 36 in London.

ABERDEEN UNIVERSITY CLUB, LONDON.—The eighty-sixth half-yearly dinner of this club will be held at the Trocadero Restaurant at 7 for 7.30 P.M. on Thursday, Nov. 26th, under the chairmanship of Mr. D. M. Cowan, M.P. The secretary's address is 9, Addison-gardens, W. 14.

# NOTES, COMMENTS, AND ABSTRACTS

## PATHOLOGICAL SPECIMENS SENT BY POST.

THE Postmaster-General draws our attention to the fact that pathological specimens have been observed in the post not packed in accordance with the postal requirements, and, moreover, sent by parcel post. In view of the risks thereby incurred by officers of the post office, we are asked to draw attention to the following regulations:—

Deleterious liquids or substances, though otherwise prohibited from transmission by post, may be sent for medical examination or analysis to a recognised medical laboratory or institute, whether or not belonging to a public health authority, or to a qualified medical practitioner or veterinary surgeon within the United Kingdom, by *letter post, and on no account by parcel post*, under the following conditions:—

Any such liquid or substance must be enclosed in a receptacle, hermetically sealed or otherwise securely closed, which receptacle must itself be placed in a strong wooden, leather, or metal case in such a way that it cannot shift about, and with a sufficient quantity of some absorbent material (such as sawdust or cotton-wool) so packed about the receptacle as absolutely to prevent any possible leakage from the package in the event of damage to the receptacle. The packet so made up must be conspicuously marked "Fragile with care," and bear the words "Pathological Specimen."

Any packet of the kind found in the parcel post, or found in the letter post not packed and marked as directed, will be at once stopped and destroyed with all its wrappings and enclosures. Further, any person who sends by post a deleterious liquid or substance for medical examination or analysis otherwise than as provided by these regulations is liable to prosecution. If receptacles are supplied by a laboratory or institute, they should be submitted to the Secretary, General Post Office, in order to ascertain whether they are regarded as complying with the regulations.

## A SUPPLY OF RADIUM.

Messrs. Derby and Co. (27, Finsbury-square, London, E.C. 2) inform us that they always have a hold of a sufficiently large quantity of radium to be in a position to deliver, within about three months, anything up to 2 g. in the form of sulphate, bromide or chloride, the present price being £56.50 per milligramme element. Although a certain quantity of radium is available for prompt delivery, it requires about 13 weeks for an accurate measurement to be taken, during which time any orders for the containers into which the radium has to be filled can be carried out. They have at the moment 100–200 milligrammes of radium available, made up into needles of two sizes: (1) containing 0·6 mg. of element: length, 16 mm.; external diameter, 1·85 mm.; screenage, 0·6 mm. (2) Containing 3 mg. of element: length, 59 mm., with same external diameter and screenage. Radium needles are hired to hospitals and practitioners for periods of 48 hours to one month. They also supply radon centres with seeds in gold, silver, and platinum, varying in size from 0·3 to 0·5 mm. wall thickness, and generally in 6 mm. lengths. They purchase second-hand parcels of radium, and make a specialty of filling and redistributing radium containers.

## THE MOST NEARLY PERFECT FOOD.

IN this little book[1] of just under 300 pages the authors have made good their claim to tell a readable story of the use of milk throughout the ages. Lecturers and others engaged in the "drink more milk" campaign should find the facts given extremely handy. Although the authorities quoted and the bibliography are almost entirely American, the lessons to be learnt apply even more forcibly to this country than in the U.S.A., as a table shows that the consumption of milk per head in the U.S.A. is almost double that of Great Britain. The question of how to get clean and safe milk is clearly dealt with. The advantages of the various forms of milk are discussed with moderation, and most of the useful milk products are referred to. We noted, however, no reference to the pleasant and safe method of consuming one's milk quota in the form of Devonshire cream and scald milk; or to the "iron cow," which now supplies milk and cream to the great satisfaction of passengers on most of our principal liners. One chapter is devoted to the home care of milk, and practical milk recipes acceptable to the housewife.

[1] By Samuel J. Crumbine, M.D., of the American Child Health Association, and James A. Tobey, Dr.P.H., author of "The Quest for Health." Baltimore, U.S.A.: Williams and Wilkins Co. $2.50.

## AN ELECTRIC TONGUE-DEPRESSOR.

Dr. F. W. Cory sends us the accompanying illustration of a tongue-depressor which he finds useful in examining the pharynx, especially of children. "The sliding spatula," he says, "is adjusted to the right position, the light is switched on and it is shown to the child who is at once interested. He is then

asked to open his mouth, the tongue is depressed, and a second only is required to see all that is necessary. The torch is removed from the glass sheath, the latter with the tongue-depressor: both are immersed in boiling water and sterilised in a few minutes, then wiped with a clean towel or handkerchief. The torch is reinserted, the tongue-depressor retracted on tube, making a portable package for the pocket. The light is easily switched on and off and the dry battery will last some time." Dr. Cory mentions that the instrument may also be used in vaginal examination. It is made by Reynolds and Branson, Ltd., 13, Briggate, Leeds.

## THE EDINBURGH F.R.C.S.

Dr. Mary Keith-Thompson, sometime on the staff of Lady Hardinge Medical College and Hospital at Delhi, has written a little guide for doctors from abroad who want to take the Edinburgh F.R.C.S., and who, she says, usually waste at least three months for want of proper guidance in their post-graduate studies. She deals with questions such as: how much time and money are required, when to arrive in Edinburgh, and where to stay, whether to choose a special subject for the examination, what classes to take, and what books to read. She remarks on the difficulty which women graduates find in obtaining suitable lodgings in Edinburgh when they desire to take the higher diplomas, and she thinks there should be a hostel for women post-graduate students in Edinburgh. The booklet is issued by Messrs. Thacker, Spink and Co., Ltd., Calcutta (pp. 29, 3s.).

## SMOKE ABATEMENT.

THE National Smoke Abatement Society has produced a valuable little book of reference for those who are called upon to speak or write on the subject of smoke abatement. This pamphlet[1] sets out in a handy form, at an extremely moderate price, a quantity of up-to-date information which has never hitherto been made available in one small volume. There are brief summaries under such headings as the Causes and Nature of Smoke; the Cost of Smoke; the Effects of Smoke upon Buildings; Health and Vegetation; English and Scottish Law in Relation to Smoke; and Smokeless Fuels. There is also a

[1] The Smoke Abatement Handbook, obtainable from the National Smoke Abatement Society, 23, King-street, Manchester. Pp. 48. 6*d*.

small bibliography, a chronological historical table' and a list of local authorities affiliated with the Society and their representatives. Some of the abstracts are signed; Dr. J. R. Ashworth, for instance, writes on the measurement of atmospheric pollution and on ultra-violet light and atmospheric pollution; Dr. J. S. Taylor on smoke and health; and Dr. Margaret Fishenden on low-temperature carbonisation. The pamphlet is for reference rather than for reading through, an intention which may perhaps justify the use of such small print. It will certainly be useful to those who need a backing of figures and facts for their appeals in this good cause.

### ELECTRIC PIANOS.

Dr. A. H. Wilson writes: "With reference to Dr. Dunne's letter in THE LANCET of Oct. 31st concerning an electric piano which he won as a second prize in a certain Spanish lottery, it may be of interest to know that I, also, won a second prize—an 'electrick piano'—in the very same lottery. I have now only to mention the fate of that piano: it is remaining in Spain, whilst the £2 10*s*. 3*d*. is remaining in England."

## Appointments

ROCHE, ALEX. E., M.D., M.Ch. Camb., F.R.C.S. Eng., has been appointed Honorary Assistant Surgeon to the Genito-urinary Department, West London Hospital.

THOMSON, A., Certifying Surgeon under the Factory and Workshop Acts for the Falmouth District of the County of Cornwall.

## Vacancies

***For further information refer to the Advertisement columns.***

*Aberdeen Royal Mental Hospital.*—Jun. Asst. P. £300.

*Altrincham General Hospital.*—Jun. H.S. At rate of £120.

*Archway Hospital, Archway-road, Highgate, N.*—Res. Med. Supt. £1000.

*Bedford County Hospital.*—1st H.S. At rate of £165.

*Brighton, Royal Alexandra Hospital for Sick Children.*—H.S. £100.

*Brighton, Royal Sussex County Hospital.*—Jun. Asst. Pathologist. £300.

*Cancer Hospital, Fulham-road, S.W.*—H.S. At rate of £100.

*Cardiff Royal Infirmary.*—H.S. to Ophthalmic Department. At rate of £75.

*Cardiff, University College of South Wales and Monmouthshire.* Lecturer and Demonstrator in Anatomy. £500.

*Chelsea Hospital for Women, Arthur-street, S.W.*—Jun. H.S. At rate of £100.

*City of London Hospital for Diseases of Heart and Lungs, Victoria Park, E.*—Res. M.O. £250. Also H.P. At rate of £100.

*Dewsbury County Borough.*—M.O.H. and School M.O. £900.

*Eastbourne, Princess Alice Memorial Hospital.*—Hon. Consulting Ear, Nose and Throat Surgeon.

*East Ham Memorial Hospital, Shrewsbury-road, E.*—Phys. to Skin Dept.

*East London Hospital for Children, Shadwell, E.*—Res. M.O. £200.

*Elizabeth Garrett Anderson Hospital, Euston-road.*—H.P. Obstet. Asst. and 2 H.S.'s. All at rate of £50. Also Clin. Assts.

*Hellingley, East Sussex County Mental Hospital.*—Jun. Asst. Res. M.O. £350.

*Hospital for Epilepsy and Paralysis, Maida Vale, W.*—H.P. At rate of £100.

*Hospital for Sick Children, Great Ormond-street, W.C.*—H.P. and H.S. Each at rate of £100. Also Clin. Assts. to Out-patient Department.

*Hospital for Women, Soho-square, W.*—Pathologist and Registrar. £100.

*Infants Hospital, Vincent-square, Westminster.*—Pathologist. £300.

*Jersey General Hospital and Poor-law Infirmary.*—Res. M.O. £200.

*Khartoum, Wellcome Tropical Research Laboratories.*—Bacteriologist. £E.660.

*Lancaster, County Mental Hospital.*—Asst. M.O. £500.

*L.C.C.*—Consulting Dental Surgeon. £400.

*Leicester, Leicestershire and Rutland Mental Hospital, Narborough.* Asst. M.O. £350.

*Lister Institute of Preventive Medicine, Chelsea Bridge-road, S.W.*—Research Fellowship in Bacteriology. £500.

*Liverpool, Alder Hey Children's Hospital.*—Res. Asst. M.O. £200.

*Liverpool, Southdown-road Hospital.*—Res. Asst. M.O. £200.

*Liverpool and District Hospital for Diseases of the Heart.*—H.P. At rate of £100.

*Manchester Royal Infirmary, Central Branch, Roby-street.*—H.S. At rate of £100.

*Manchester, St. Mary's Hospital.*—H.S. at Whitworth Pork Branch. At rate of £50.

*Margate and District General Hospital.*—Res. M.O. £150.

*Mount Vernon Hospital, Northwood, Middlesex.*—Res. M.O. £250.

*National Hospital, Queen-square, W.C.*—Hon. Asst. Radiologist.

*New Zealand, University of Otago and Dunedin Hospital.*—Sen. Res. Surg. and Medical Officers. Each £500.

*Oldham County Borough Education Committee.*—Asst. Schools M.O. £500.

*Oxford, Radcliffe Infirmary and County Hospital.*—Hon. Phys., Hon. Asst. Phys., and Hon. Asst. Radiologist.

*Plymouth, South Devon and East Cornwall Hospital.*—Radium Officer. £600. Also Res. Surg. O. and H.P. At rate of £150 and £120 respectively. Also H.S. £100.

*Preston, Biddulph Grange Orthopædic Hospital.*—Sen. and Jun. H.S. At rate of £250 and £150 respectively.

*Queen's Hospital for Children, Hackney-road, E.*—H.P. and Cas. O. Each at rate of £100.

*Reading, Royal Berkshire Hospital.*—Res. M.O. for Blagrave Branch Hospital. At rate of £150.

*Rotherham County Borough.*—Tuberculosis Officer, &c. £600.

*Rotherham Hospital.*—Sen. H.S. £200.

*Royal College of Surgeons of England.*—Election to Court of Examiners.

*Royal National Orthopædic Hospital, 234, Great Portland-street, W.*—Med. Registrar. £150.

*Royal Naval Medical Service.*—Medical Officers.

*Ryde, Royal Isle of Wight County Hospital.*—Res. H.S. £180.

*Sheffield University.*—Chair of Pathology.

*St. Helens Hospital, Lancs.*—H.S. £200.

*St. Mary's Hospital, Institute of Pathology and Research, Paddington, W.*—Research Studentship. £200.

*St. Mary's Hospital, W.*—Hon. Orthopædic Surgeon.

*St. Thomas's Hospital Medical School, S.E.*—Professor for the University Chair of Medicine. £2000. Also Pathologist to Medical and Surgical Units. £400.

*Salisbury, General Infirmary.*—Two H.S.'s. Each £150.

*Salop, Cheshire Joint Sanatorium, Market Drayton.*—H.P. £250.

*Sheffield Royal Hospital.*—Two Asst. Cas O.'s and Res. Anæsthetist. Each at rate of £80.

*Taunton and Somerset Hospital.*—Jun. House M.O. At rate of £100.

*Truro, Royal Cornwall Infirmary.*—H.S. £170.

*Wakefield, Clayton Hospital.*—H.S. At rate of £200.

*Wolverhampton, New Cross Hospital.*—Asst. Res. M.O. £200.

*Wrexham and East Denbighshire War Memorial Hospital.*—Two Res. H.S.'s. Each at rate of £150.

*York County Hospital.*—H.S. to Ear, Eye, Nose, and Throat Dept. £150.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Stratton (Cornwall) and at Walsall (Staffs).

The Home Secretary gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act for the Districts of Daventry and Rugby County Courts, and also for the District of Barrow-in-Furness, &c., Circuit No. 3. Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W., not later than Nov. 21st.

## Births, Marriages, and Deaths

### BIRTHS.

BAIN.—On Nov. 4th, at Straymede, York-place, Harrogate, the wife of Dr. Curtis Bain, of a daughter.

RICHARDS.—On Nov. 8th, at Forbes Fraser Hospital, Bath, the wife of Dr. W. K. A. Richards, of Westbury, Wilts, of a son.

SIMPSON.—On Nov. 5th, the wife of Dr. James D. Simpson, Bridge-street, Cambridge, of a son.

TAYLOR-YOUNG.—On Nov. 5th, at The Red House, Park-lane, Salisbury, the wife of H. S. Taylor-Young, F.R.C.S., of a daughter.

### DEATHS.

ALDRED.—On Nov. 7th, Wilfrid Ashwell Aldred, M.R.C.S., The Grange, Wroxham, Norfolk, aged 51.

GYTON.—On Nov. 5th, 1931, at 273, Lavender-hill, S.W.11, Walter G. Gyton, M.R.C.S., L.R.C.P., aged 78 years.

POLLARD.—On Nov. 5th, a few days before his 76th birthday, at St. Winifred's-road, Bournemouth, Bilton Pollard, M.D., F.R.C.S., Consulting Surgeon to University College Hospital, London, and to Queen's Hospital for Children, London.

RICE.—On Nov. 3rd, at Palace Cottage, Crediton, Devon, George Rice, M.D., Consulting Physician, Derbyshire Royal Infirmary.

ROBINSON.—On Nov. 6th, at Burnham Overy, Norfolk, Thomas Robinson, M.R.C.S., D.P.H., of Scraptoft Vicarage, Leicestershire, formerly County Medical Officer for Leicestershire.

SEYMOUR.—On Nov. 6th, at Westgate-on-Sea, Dr. Thomas Peacock Seymour, late of Tiverton, Devon, and Captain R.A.M.C., aged 53 years.

***N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.***

MATERNITY HOME AT LEIGH.—Mrs. Higgenbotham, mayoress of Leigh (Lancashire) has formally opened a new maternity home, installed in the former residence of Sir George Holden. There is accommodation for 18 cases, with a nursery, and the cost of adaptation has been £1150. The property cost £4000 to purchase.